KANSAS STATE AGRICULTURAL COLLEGE
MAY 28 1926
REMAT

Veterinary Medicine

VOL. XXI JUNE, 1926 No. 6

FOOT-AND-MOUTH DISEASE IN MEXICO

Effective May 7, an order issued by the United States Department of Agriculture established quarantine regulations to prevent the introduction of foot-and-mouth disease, into the United States, from Mexico where that livestock scourge has recently been discovered for the first time.

Since the disease is in the southern portion of Mexico the menace is still at a considerable distance and the regulations are purely of precautionary measure. They prohibit the importation into the United States of cattle, sheep, goats, other ruminants, and swine, also of hides, skins, other animal by-products, hay, straw, and feeding material originating in the portion of Mexico south and east of the Tehauntepec National Railway which crosses the Isthmus of Tehauntepec. The quarantine order applies also to the same classes of animals and products shipped through such area, or unloaded in it.

The existence of foot-and-mouth disease in Mexico is occasion for extra precautions on the part of livestock owners, especially in the southern portion of the United States. Veterinarians and stockmen are requested to report promptly to the Department of Agriculture and to State sanitary officials the existence of any symptoms resembling those of foot-and-mouth disease.

Only about 65 per cent of the pigs farrowed live to reach the market. Of the 35 per cent that die, the greatest mortality occurs during the first 10 days, says the United States Department of Agriculture. During this time weak pigs die or are killed, accidental deaths and injuries occur. Digestive disturbances and mismanagement bring the toll of loss to a point which staggers even the hog raiser who has yearly experienced these losses, but who has never tabulated them.

When corn was worth a dollar a bushel and tankage $60 a ton, each pig has cost approximately $2.75 at birth, under average conditions. Many of these losses which occur during the first 10 days could be avoided by better management of the brood sows and closer attention to them at farrowing time. Reducing the mortality among all kinds of young animals is an easy way to increase profits.

FOREIGN PARASITOLOGISTS EXPRESSING INTEREST IN PROPOSED RANSOM MEMORIAL

A progress report on the B. H. Ransom memorial fund shows the interest that is being expressed in the proposition not only by Dr. Ransom's fellow countrymen but by parasitologists in numerous foreign countries where he was held in high regard. The fund has now reached the sum of $622; of this amount $121 has come from foreign countries. The latest contributions to be received from abroad are from the small country of Roumania, and include donations from a prominent parasitologist of Bucharest, the Ministry of Agriculture and the members of the Laboratory of Parasitology of the Faculty of Veterinary Medicine. A Japanese parasitologist has pledged $25 to the fund while others in Germany, France, Denmark, China, India and Canada have sent $10 or more in each case. Other countries represented are England, Switzerland, Belgium, Sweden and Italy, making a total of 13 foreign countries.

A large majority of both foreign and American subscribers have voted that the memorial take the form of a money prize

or a scholarship in parasitology. Since the fund is still inadequate for either of these purposes, the committee has decided to postpone making a definite choice until a later date and it is hoped that American scientists who are interested in this proposition and who have delayed in making their contributions, will do so at an early date. Checks may be sent to Dr. Eloise B. Cram, Secretary, Ransom Memorial Committee, Bureau of Animal Industry, Washington, D. C.

SECRETARIES JARDINE AND HOOVER EMPHASIZE HIDE CONSERVATION

Plans for a nation-wide campaign to improve the quality of raw hides and skins used in making leather were outlined by the United States Department of Agriculture and approved at a recent conference by representatives of farmers, cattlemen, dairymen, butchers, hide dealers, tanners, and shoe manufacturers. Millions of dollars are annually lost to producers of the raw material and consumers of finished leather goods through imperfections in raw skins and hides which result from faulty skinning and curing, careless and excessive branding, and the effects of diseases and parasites.

Secretary of Agriculture Jardine speaking before the conference told of the enormous quantity of leather used in this country for shoes and harness, 300,000,000 pairs of shoes being bought each year at a cost of more than $1,500,000,000, and of the great waste that might be avoided by producing a better quality of raw material for leather making.

"I hope," he continued, "that a cooperative basis for operating can be devised that will enable the producer to get a price that will encourage him to take more pains in skinning his animals and curing the hides than he feels is possible under present circumstances, or that he will be able to get shoes that will wear longer and harness that is more durable and less expensive. In other words, if we are going to reach our objective we should put up better goods at a better price, which will probably encourage demand."

Secretary Hoover, in his talk before the conference, said "the one theory of economy that will hold water is that of the elimination of waste." "If you can bring about the elimination of waste in the production of raw leather-making material," he added, "you will first benefit the farmer, then cut the cost of leather production, and in the end benefit the consumer."

In line with the department's plan to eliminate waste and improve the quality of raw material, an advisory committee will be appointed to work primarily on the economic aspects of the several technical problems and to enlist cordial support for the campaign. Other committees will be appointed by Secretary Jardine, one to work on the problem of grubs, insects, diseases, and branding; another on the problem of skinning and curing; a third on classification and marketing; and a fourth on statistics.

The elimination of grubs, ticks, and other insect pests, and the prevention and cure of diseases will pay the farmer and cattlemen well in increased milk and beef production. The department has long fostered such movements as a means of increasing the profits to livestock men. The leather industry and allied interests will add the force of their publicity and educational campaign to further encourage these practices, first as a means of producing healthier and more profitable livestock, and finally to secure a better quality of hide.

The loss due to the cattle grub has been estimated at from $50,000,000 to $100,000,000 annually, a loss which is felt by several industries. Dairymen have estimated a reduction of 10 to 25 per cent in milk flow is often due to irritation by the grubs. The growth of young stock is retarded and vitality is reduced through grub infestation. Cattle raisers and feeders suffer from a like reduction in the condition of cattle on feed and the loss of growth and vitality in young stock.

Butchers and packers lose money on hides that have grub holes in them, hides with five or more holes in them being discounted, according to trade custom, one cent a pound. The tanning industry as a whole prefers grub-free hides. For certain uses a single hole in the hide makes it unserviceable. The grubs perforate the skin along the back of the animal, thus damaging the portion which is of the greatest value when the hide is tanned, and the extra handling of hides necessary in classifying them as to grubbiness is an economic loss.

Faulty skinning and curing are responsible for tremendous annual money losses, especially in those hides taken off and cured on the farm and ranch, or by town and country butchers. The department has repeatedly emphasized the fact that this condition can be remedied only by making it more profitable for these men to take more care in skinning and curing. Premiums for quality hides would be an incentive for more care. The practice of hammering down the price of a hide simply because of its "country" origin must be eliminated, says the department, if improved methods of skinning and curing are to become effective. "Flat" buying of country hides must go before general improvement can be brought about. It will be the duty of the committee on this subject to work out practicable ways to improve the methods of skinning and curing in the country which can be demonstrated by the department and kept constantly before the public through the agricultural and trade press.

The approved plans also call for a committee on marketing and classification of hides. A system of marketing and classification that is fair to all interests will be worked out. It is in this work that the success of the cooperative effort will be determined because it will show whether or not the smaller producers of hides are getting anything for their greater care and labor in improving quality. A fourth committee will devise better means for obtaining more accurate statistics, especially in connection with the supply of country hides.

All of these forces working in harmony and to a definite end should, in the opinion of the department, result in improvement in the quality of raw hides and skins for leather making.

COST OF WORK HORSES ON CALIFORNIA FARMS

A study of the cost of keeping 812 work horses on 187 California farms indicated that under the conditions existing at the time (for year 1922) the average cost per animal per year amounted to $172.19.

The average cost of maintaining horses on orchard and vineyard farms was found to be higher than on dairy and field crop farms, being $211.14 for the former group and $163.58 for the latter group. Of the various items making up the cost of maintaining work horses, feed and chores are the two largest single costs. These amounted to $112.32 (or 68.9%) for the dairy and field crop group, $162.16 (or 77%) for the orchard and vineyard group.

The majority of operators fed hay only, at an average rate of 6 tons per head per year. When grain was fed the amount averaged 780 lbs., with a reduction of but one-tenth of a ton of hay. An average of five months of pasture replaced 1.7 tons of hay.

Prices for the period of study mostly ranged between $15 to $18 per ton of hay, $2.50 to $3 per horse-month for pasture, $1.75 per 100 pounds for grain, 30.9 cents per hour for choring, $1.62 for taxes, $5.01 for shoeing, veterinary and similar miscellaneous minor items, $12.77 for shelter and $6.66 for use of equipment.

Credits (for colts and manure) were relatively small. The value of the manure is apparently not appreciated by horse owners.

Mortality averaged 5.1 per cent, depreciation 8.14 per cent.

The number of hours that horses are used per year is the greatest single factor affecting cost per hour. Yearly use was found to range from 454 to 3382 hours

per horse, with a general average of 1527 hours.

The average cost per horse-hour for time actually worked amounted to 11.03 cents, or approximately $1 per day for a 9-hour day.—University of California Experiment Station Bulletin 401.

U. S. TO ENTER FOR FIRST TIME IN WORLD'S POULTRY CONGRESS

That the world's greatest poultry industry—that of the United States—will be represented at the World Poultry Congress and Exhibition at Ottawa, Canada, in 1927, is now practically assured, says Dr. M. A. Jull, in charge of poultry investigations, United States Department of Agriculture. The passage of the bill by both the Senate and the House makes possible this country's participation. It remains only for the department to sesure the necessary appropriation.

It will be the first time the United States has participated in the world event of which this is the third. The first congress was held at The Hague in 1921 and the second at Barcelona, Spain, in 1924. Twenty-five countries have already made application for entrance in the Canadian show.

The United States is the leading poultry country, having more than one-third of the world's poultry population. China comes second, with about 16 per cent of the total.

The poultry industry in the United States ranks sixth in value of products, being exceeded only by dairy products, corn, cotton, hay and forage, and swine. It is easily a billion-dollar industry. Not only is it important from a monetary standpoint, but also in point of numbers of people directly and indirectly interested. More people are directly interested in raising poultry than in the production of any other class of livestock or crop. It is estimated that poultry is raised on 90 per cent of the farms in this country, many of which report that it is one of the best-paying crops. Indirectly from 75 to 90 per cent of the people are interested in poultry from the consumption standpoint.

The exhibit to be prepared under the direction of the United States Department of Agriculture will portray the fundamental features of the industry and its importance as an agricultural crop in the United States.

Efforts are being made by humane societies to have the subject of the protection of animals placed on the agenda of the Assembly of the League of Nations next September.

In Philadelphia 33,750 dogs were licensed in 1925 and 22,563 destroyed because they had not been licensed.

The New York Times stated recently: "There is one thing a motor vehicle cannot do—turn around and go along while the driver is delivering bottles of milk. The horse is easily trained to do the trick, and he is a companion to his driver. He seldom goes 'dead,' and he does not have to be repaired on the road. He can be driven for years without maiming and killing pedestrians."

A new word "pitilacker" to be applied to one who is thoughtless and indifferent toward animal suffering, has been chosen by the Pennsylvania S. P. C. A. as the best term submitted in a recent contest for a specific designation of the inhumane individual.

A goat rancher at Roosevelt, Texas, has devised a coat for individual animals to be worn at shearing time when they are deprived of their usual mohair coats. It is stated that already 14,000 of these garments are being worn by goats in that vicinity. The coats are of cotton duck and water-proofed. They are loose-fitting and designed to keep the animal's skin dry and to maintain a normal body temperature even under adverse weather conditions.

VARYING EFFECT OF POISONS ON ANIMALS

The smallest snail will withstand more strychnin than an adult man. Many of the stronger cardiac poisons have no action whatever on insects. The rabbit can take more morphin than can a man fifty times the animal's weight. Doses of lead, nicotin, etc., sufficient to poison man fatally do not injure the goat. Amygdalin does not affect dogs, but it kills rabbits. The hedge-hog takes with apparent enjoyment a dose of cantharides that will kill several persons under excruciating pains. Whereas, the frog is extraordinarily susceptible to the digitalis poisons, they have no effect upon the toad.—Am. J. Pharm.

"An important reason for the widespread use of proprietary remedies is the attention the manufacturer gives to the elegance of his preparations, and the lack of knowledge in this respect on the part of most physicians."

The Massachusetts S. P. C. A., in their publication, "Our Dumb Animals," report that last April out of over 40 prosecutions, 36 had to do with non-sheltering and allowing live stock and other domestic animals to starve, most of these cases being in the country districts of the state.

Thirty thousand dogs were licensed in Los Angeles, Cal., last year.

During one month, 54 cats and 49 dogs were killed by autos on the streets of Long Beach, Cal.

According to Prof. Knud Faber of Copenhagen, Denmark, in cases of anemia, of simple or pernicious type, marked improvement, in symptoms and signs, often follows the protein shock due to injections of boiled milk.

Professor B. S. Hopkins, of the University of Illinois, has isolated the hitherto unknown element 61 after detailed chemical work extending over several years. The element is named "illinium" after the university at which it was discovered, and its symbol will be the first two letters of its name, "Il."

The United States, says Dean C. F. Curtiss of Iowa State College, is approaching an actual shortage of horses, and he regards this as one of the most disturbing conditions now confronting American agriculture.

This country produced, consumed and exported less meat in 1925 than in the preceding year, according to a review of the industry made public by the Institute of American Meat Packers.

Every package of parcel post in the city of New York is delivered by a horse because the waiting time, while these wagons are being unloaded and delivered through the buildings by the postmen, is so great that it can be done with a horse at about half the cost it would be with an automobile.

A new organization of sheep permittees, who range their bands on the Colorado National Forest, has recently assessed its members 2½ cents a head on each animal grazed for maintaining a Government hunter on the range. This makes a total of nine national forests in Colorado where sheep permittees have adopted such measures for combating predatory animals.

An automobile assembling company in Oregon found that rats were damaging the fenders of new automobiles in stock. The fenders were covered with a heavy wrapping paper pasted to them, presumably with a starch paste the edible qualities of which the rats had discovered, and in gnawing it the animals had so scarred the fenders that they had to be re-enameled. Poison was placed and numbers of dead rats were found.

More than one-half of the pig crop is lost every year in the state of Oklahoma, according to C. P. Thompson, swine husbandman of the A. & M. College of Stillwater. These losses are largely attributed to inadequate facilities and improper care at the time of farrowing.

A stock salt is now on the market that is said to be effective in diminishing the ravages of flies. It is advised that this salt should be provided for stock as soon as turned on grass and kept before them constantly. If this will prohibit flies from irritating livestock it will be a valuable product..

One chick infected with the B. pullorum may infect all the chicks of a hatch and contaminate the incubator and brooder, and thus infect future hatches. White diarrhea in chicks is practically incurable and those showing the affection should be destroyed and burned and the surroundings thoroughly cleaned and disinfected.

A recent case of food poisoning in Kansas City, Mo., with one fatality has been traced to milk that was apparently infected with the B. suipestifer or a microorganism belonging to the same group. This milk was produced in a barn that was built for a hog house and recently remodeled for a dairy barn. It is known that B. suipestifer infection prevailed on this farm in the swine prior to the time that it was converted into a dairy.

A new treatment for diabetes has been advocated by Singer, an Austrian physician. The treatment consists of the injection of certain proteids. The effects of this treatment are more lasting than that of insulin. Over fifty per cent of cases treated by Dr. Singer showed substantial improvement. Any therapeutic agent that has curative value should be thoroughly tested and standardized before it is recommended for general use, otherwise serious results will probably occur.

Transfusion of blood is an old practice. The results were uncertain until it was found that the blood from human beings could be divided into four different groups. Successful transfusion has been dependent upon using blood of the type or group from the same species of animal that corresponds to that of the patient. The transfusion of non-specific blood frequently resulted in death. According to recent investigations, the beneficial result of transfused blood is due to the red blood corpuscles and the plasma of the non-specific blood contains the injurious substances. It was further demonstrated that washed red blood cells of one species of animal can be injected into another without danger. This will simplify the transfusion and it also makes possible the preparation of red blood cells as a therapeutic agent that can be provided without delay. However, it is not advisable to recommend the use of red blood cells for transfusion, until further evidence is available.

Recently two investigators, one at the Carnegie Institute, the other at Johns Hopkins University, have reported that one form of cancer in chickens is a mass of white blood cells that have deserted their normal function. This type of cancer can be transmitted by plasma or white blood cells from an affected to a healthy chicken.

Thus blood is a very interesting tissue; washed red blood cells are a valuable therapeutic agent in certain conditions, while plasma from healthy animals may be toxic even for the same species of animals; plasma from chickens affected with a certain form of cancer is capable of producing cancer in healthy chickens, and white blood cells from chickens affected with one type of cancer reproduces cancer when injected into healthy birds. These interesting reports will probably be supplemented with more concise information. Certain it is that care and judgment should be exercised in the use of blood or any portion of it as a therapeutic agent.

Study of the Phenomena of Oestrus and Reproduction in Domestic Animals with Case Reports

(8th Report)

B. A. ZUPP and H. S. MURPHEY, Department of Anatomy
Iowa State College, Ames, Iowa

STERILITY OR INABILITY to produce young is a condition that is either acquired or congenital. In a large majority of cases it is acquired either by disease, malnutrition, accident, misuse, or senility. A comparatively few cases of sterility are of congenital origin and the most of these are due to congenital malformation of the reproductive organs. Sterility is not a condition that is confined to any one sex, breed, or locality, but is causing a heavy financial loss throughout the entire live stock producing world. It affects both sexes of all the various species of animals as well as man.

We have concentrated our studies on the cow but have not neglected to study all available cases in the bull or the other species of live stock. It would be too great a task for anyone to attempt to solve the phenomena of oestrus and reproduction in all the various species of domestic animals at the same time. We know, however, that the cyclic changes of oestrus as they are found in one species of animal cannot be applied to another species in their entirety. Although the same routine method of study may be used, the final conclusions will vary with the species and each will show phenomena that are characteristic of that species only.

The results obtained in many of the cases that have been presented for treatment have encouraged us to continue our work. We do not claim 100 per cent results but do think that some of our results are worthy of consideration. However our work has just begun, a part of it being purely experimental, and we cannot draw positive conclusions from one or only a few selected cases. One of our greatest difficulties so far has been to diagnose and classify the various types of functional sterility as they were presented to us for treatment. Now we feel as though we can at least classify them so that they will fit into our category even though we may not always be able to offer a definite diagnosis as to the primary cause.

In order to classify our cases to date we will repeat and add another subdivision to the classification as it appears in the June, 1925, number of the Journal of the A. V. M. A.

A. Functional: Organs normal when examined with glass speculum and by rectal palpation.
   1. Heifers, never in heat.
   2. Heifers, regular but non-breeders.
   3. Heifers, irregular but non-breeders.
   4. Sterile cows in classes 1, 2, and 3.
   5. Senile cows.

B. Pathological.
   1. Cases of chronic pyometra.
   2. Cystic ovaries.

We feel that this classification will have to be modified from time to time as our work progresses and as we are able to make a more definite diagnosis. With our present knowledge of endocrinology and metabolism we know of the many cases that come under classes 1, 2, 3, and 4 are of endocrine or metabolic origin.

Those cases of sterility that are of metabolic or nutritional origin, can often be corrected by the diet, especially if the cause of the ailment is obesity or undernutrition, while those cases of sterility

that are caused by disease of some part of the endocrine system will be more difficult to treat even after they have been definitely diagnosed. We feel that if these cases of endocrine sterility are treated it will have to be through endocrine therapy, by hormones, extracts or gland transplantation. We have been doing some experimental transplantations but doubt the necessity of this difficult procedure except in senile cases where the oestrual hormone has failed—since cases of functional sterility may often be cured by a single injection of oestrual hormone. We are at present making special efforts to hold a complete post-mortem examination on every animal available where we think the sterility is of endocrine origin. We have found diseased conditions of both the hypophysis cerebri and thyroid glands.

Oestrous Cycle Ox. Ex. No. 34

An aged Jersey cow was brought to our attention in August, 1925, with a history that until she had her last calf she had been a regular breeder. She had been bred on January 1, 1925, April 16, May 13 and June 3. She was again in heat on June 26, August 11, and September 4. On September 22 she was injected intravenously with one dose of oestrual hormone. Following this injection she was not in heat again until November 17. By this time the cow had gone dry and the owners decided to dispose of her. She was slaughtered on December 17 and we had the privilege of conducting a detailed post mortem examination.

The only gross pathology of the genital organs that was found was a slight cyanosis of the mucous membrane of the vagina and cervix and a slight thickening of the vaginal and uterine walls. The thyroid gland appeared large, both lateral lobes were prominent, a deep reddish brown color, and were connected by a very prominent isthmus. The entire gland, after it had been carefully dissected, weighed 30 grams. The hypophysis cerebri showed considerable enlargement. It weighed 5 grams. And in its posterior part it contained a cystic body about the size of a navy bean. This cyst was filled with a semi-solid, yellowish, gelatinous material and when cut offered the resistance of rubber. The remainder of the endocrine sterility glands appeared normal.

This case has been classified as endocrine sterility due to disease of both the hypophysis cerebri and the thyroid glands and was considered incurable.

Oestrous Cycle Ox. No. 74

A white Shorthorn heifer with a history that she had only been in heat once and bred but did not conceive. When examined per rectum the condition was diagnosed as congenital malformation of the genital organs and the condition was described almost as completely as found on post mortem.

This animal was slaughtered for food and the genital organs and endocrine glands were removed and examined. The vulva was small and the clitoris was large and firm and resembled a small penis. The vestibule was small and slightly congested. The vagina was only about four inches long and showed quite a marked inflammation due to the passing of the vaginal speculum and the removal of a small congenital band which was present in the region of the hymen. The cervix was represented by a mere band of tissue with no lumen. The horns of the uterus were present as small tubular structures and were about two inches long. The right uterine tube was present but the left was incomplete. The ovaries were represented by small yellowish bodies about the size of a grain of oats. The broad ligaments of the uterus were well developed.

From the bifurcation of the uterus to the inguinal rings were cord-like structures in a special fold; these cord-like structures contained some muscle fibers representing the cremaster internus muscle of the male. There were no vaginal rings present but the inguinal rings were quite definite.

Oestrous Cycle Ox. Ex. No. 26

A pure-bred Guernsey cow came to our attention with a history that she had been bred on March 11, 1924, and had showed no signs of heat since. When her gestation period should have expired she did not freshen and showed no signs of pregnancy.

When this cow was first examined no diagnosis was made except that the uterus contained something which had drawn it out of reach. The cervix and only part of the body of the uterus could be palpated, these organs were enlarged and firm. The ovaries were not found and the blood vessels supplying the uterus showed no increased pulsation. Through the vaginal speculum the tract showed nothing abnormal.

On June 30 and July 1, 1925, this cow was injected intravenously with a triple dose of corpus luteum extract with the idea that it might stimulate the uterus to contract and expel its content. This it failed to do but following the second injection the cow went off feed for three days so no more injections were given at this time.

On July 23, she was injected subcutaneously with six doses of oestrual hormone but here also no apparent results were observed. Following this the cow was carefully examined several times but no changes were noted in her condition. It was then decided to perform an exploratory laparotomy in order to make a diagnosis.

On September 11, Dr. Covault operated through the left flank and found a mummified fetus in the right horn, which was not surrounded by fluid but by a heavy, gummy material. He removed the entire corpus luteum of pregnancy of the right ovary from the body so it could be used for histological study. The wound was then sutured and dressed. On September 13, the cow was discharging a dark brown colored, gummy, gelatinous material. She showed no general disturbance. Upon further examination the vagina was found filled with this dark brown colored material and the cervix had dilated and the fetus had just started through.

The cow showed no labor before nor during the removal of a 15-inch fetus, and as soon as the fetus was removed she continued her feeding. The body and cornua of the uterus had contracted down upon the fetus and the cervix had relaxed as in a normal parturition, while the vagina, vestibule and vulva together with the sacro-sciatic ligaments had not relaxed and had shown no preparation for parturition. The fetus was a deep brown color and free from odor. On September 14, the uterus had emptied the remainder of its contents.

Following this the cow developed induration of the right horn of the uterus and adhesion of the uterus to the region where the laparotomy had been performed. On November 16 and 17, the cow was injected intravenously with a triple dose of oestrual hormone on each date.

On Jan. 5, 1926, the cow was again examined and the uterus was in good condition except for the part which was adherent to the abdominal wall in the region where the laparotomy had been performed.

Oestrous Cycle Ox. Ex. No. 25

A grade Holstein heifer which we obtained on July 24, 1925, had had her first calf about four months previously and had been rebred. She was in heat again July 28 and August 18. When examined on August 28, a large corpus luteum was found in the right ovary which was expressed from the ovary, and allowed to drop into the abdominal cavity. The purpose of removing the corpus luteum was to see if the cow would come into heat following its removal. On August 30 or two days later, the cow was again in heat. This time she was allowed to pass through a normal cycle and was in heat again on September 22.

On September 28 or six days after heat, the cow was examined and a large corpus luteum was again found in the right ovary. It made up the greater part of the ovary and had a well defined pro-

tuberance. On this date Dr. Bemis operated through the right flank and removed the corpus luteum from the ovary and brought it outside of the body. In order to get it all he removed it by dissection. The purpose of this operation was to see what effect it would have on the oestrous cycle if the corpus luteum were entirely removed from the body.

On October 1 or three days later, the cow was in heat and bred but did not conceive. When examined on this date the left ovary contained an ovarian follicle about 18 m.m. in diameter while the right ovary contained no definite bodies and the cavity left by the removal of the corpus luteum was imperceptible. The cow was re-examined on October 6 and another corpus luteum was developing in the right ovary. The follicle in the left ovary had become atretic and could not be palpated.

On November 22 the cow was again in heat and bred. On January 7, 1926, she was diagnosed pregnant.

Hydrops Amnii

J. F. DeVINE, Goshen, N. Y.

A READER of Veterinary Medicine sends in the following query:

"I have encountered a condition here on which I should like a little enlightenment. There is a small herd of Ayrshires, the majority purebred, in which every year there have been from one to three cases of dropsy of the fetal membranes. As the herd consists only of 15 to 20, including young cattle, this is something unusual. They are kept in a good modern barn now but were formerly in an old one where they had the same trouble. They are under perhaps a little better than average conditions. The foundation stock came from two different herds, in neither of which a case of this kind has been recorded, nor have there been other similar cases on adjoining farms under the same conditions. The pasture is hilly with some timber typical of this section. Some animals have been relieved by draining a portion of the fluid with a trocar. Others have had small doses of salines daily, potassium iodid, etc. Several cows have gone full time and were apparently healthy after calving."

The condition described has been classified in veterinary obstetrics as hydrops amnii, and in reviewing it I will quote from Fleming's "Obstetrics." Notwithstanding it was published nearly half a century ago, his description of this ailment varies so little from our present day knowledge that it makes interesting as well as instructive reading. True, he did not know at that time that the condition could be produced in cattle by breeding cows to buffalo bulls, a thing that several have since observed. His opinion, in the case of a cow, was that all fetuses must perish, and he neglects to go into the minute detail which is so characteristic of his work, as to handling or relieving the condition. He does mention the puncturing of the fetal membranes and allowing the escape of fluid but fails to caution the inexperienced operator that unless the animal is well along in gestation, so much so that the cervix has begun to soften and relax, the task of dilating a normally tight cervix is a good bit more than a boy's job. Neither does he stress that if the dam is to be saved when once dilation is attempted and the operator is sufficiently successful to allow the entrance of the hand, he then fails in his duty if he neglects the case a minute until delivery is complete, because it is plainly evident that a uterus that has been so stretched has lost all tone, and if the cervix is dilated and the fetus not removed the anemic and paralyzed uterus is at once at the mercy of infection, which is quite certain to bring death to the dam.

Several years ago, we had a case very

similar to the one described by Cartwright. A middle-aged, standard bred mare with an early appearance of twin pregnancy later suffered such distress and distension of the abdomen that the owner had us examine her. We diagnosed hydrops amnii and found a small portion of the fetal membranes protruding through the cervix. It is, of course, common knowledge that the cervix of the mare is much more readily dilated than that of the cow. A small incision was made into the membranes and a great quantity of fluid escaped. The mare was in the tenth month of gestation and about three weeks later an apparently normal foal was born and the mare did well.

While it is true that most cases we have seen in the cow terminated fatally, still we have also seen some cases recover. Not long since, we had an interesting case in a grade Holstein cow where the abdomen assumed enormous size, but the animal seemed strong, had a good appetite and was able to get up and down until about eight and one-half months after conception. As soon as it was evident that she could not rise any more, we dilated the cervix, taking nearly a day to do so. Our manipulation induced straining and along toward evening we were able to rupture the membranes and it was estimated by several onlookers that surely half a barrel of water escaped. The fetus was still alive and delivered. The cow, after lingering several days, was finally able to get on her feet and on being turned to spring pasture soon regained good health and was sent to the butcher that fall.

I realize that none of this enlightens our colleague as to how to prevent the ailment. I frankly confess that I know not. I should bend every effort to aid nutritional balance and then watchfully wait. It has long since been recognized in dropsical conditions that saline cathartics and diuretics are of an advantage and it is comparatively a simple matter, after the condition is once recognized, to give a small dose of Epsom salt in the feed once a day or once every two days, or in the drinking water, and it is equally as easy to give a little nitrate of potash daily or every other day. The result, of course, of such medication is entirely problematical, but reasoning from analogy we may expect some good. Let us hope that others who read this inquiry may come to our aid.

Hydrops Amnii (Fleming)

"When there is an unusual secretion of the amniotic fluid it constitutes what has been termed 'dropsy of the amnion' (hydrops amnii or hydramnios): a condition which, when very marked, is serious for the mother as well as the fetus. A number of cases have been recorded and Saint-Cyr has enumerated thirteen, ten of which occurred in the bovine, two in the equine, and one in the caprine species. Gierer, who has published an interesting account of several cases, observes that it is most frequently met with in poor, badly-fed animals—and particularly in cows, in which improper hygiene has produced a morbid excitement of the generative organs; the result of which is that the act of exosmose and endosmose does not take place equally through the walls of the placentae and placentulae.

"Symptoms—It is not until the fifth or sixth month of pregnancy, or even later, that indications of this condition are evident. Then the abdomen rapidly enlarges, especially to one side—generally the right; and in a short time it has acquired a greater volume than it has towards the end of gestation. At this period the health becomes deranged, and colic, with or without tympanites, is not infrequent. General debility is so marked that the animal can scarcely, if at all, stand; the appetite is lost, rumination is suspended, defecation and micturition are irregular, edematous swelling of the limbs and abdomen ensue, with dyspnea, which increases so quickly in intensity that asphyxia is often imminent. The muscular parietes of the abdomen have in some cases been ruptured and the entire mass of the uterus, with its contents, has formed a subcutaneous hernia. The ordinary period of gestation may be com-

pleted; or abortion may occur at the seventh or eighth month, when all the indications of such an occurrence are present. The uterine contractions, owing to the relaxed condition of this organ, and its distended and paralyzed fibres, are weak, the pains feeble and unsustained, the os does not dilate and the act of parturition is consequently tedious.

"Diagnosis—The state of the abdomen might lead to the supposition that the case was one of tympanites or twin pregnancy. Abdominal percussion and the 'touch' as well as auscultation, should aid in diagnosing this condition. Rectal examination will reveal the immense size of the uterus, which forms a great globular mass in the abdominal cavity and almost completely fills the pelvis, though nothing of a fetus can be detected; while vaginal exploration discovers the cervix uteri effaced, the os closed and the posterior part of the uterus projecting more or less into the vagina; pressure on this prominent portion proves that it contains fluid, though usually no fetus can be felt, as it is beyond the touch and almost lost in the small ocean of fluid surrounding it. In rare cases the os is partially dilated, and the fetal membranes protruding more or less into the vagina; usually, however, scarcely one or two fingers can be introduced into it.

"Results—The occurrence of hydrops amnii is nearly always fatal to the fetus. In none of the thirteen cases alluded to by Saint-Cyr was it alive; in a certain number it appeared to have lived up to the period of parturition or abortion; in others it had been arrested in its development and was dead for some time. In a goat, the two fetuses were in a state of general anasarca and completely infiltrated.

"The mother may or may not survive. Of the above cases three perished from the disease; one was killed as incurable; another recovered after a long time; one was subsequently sold for food; five got well so rapidly and completely as to be bred from again. The results have, as a rule, been more favorable as assistance has been prompt and early.

"After death the uterus is found excessively dilated, pale in texture, with ecchymoses on its surface. The fetal membranes vary, sometimes being thickened and dense, and other times attenuated and friable. The liquor amnii has been found contained in alveoli or cells formed by the processes uniting the allantois to the amnion; so that the membranes might be torn in several places without all the fluid escaping—in this respect resembling the vitreous humor of the eye. The liquor is usually limpid and transparent, or of a pale citron color, with a slightly sweetish taste; its quantity, as has been remarked, is always considerable; as much as 50, 70, 100, 120, 150 and even 180 litres having been found.

"One example of this condition will suffice. It is given by Mr. Cartwright of Whitchurch, and the subject was a Thoroughbred racing mare, whose extreme size while pregnant was ascribed to the presence of twin fetuses and also, it would appear, to an excessive quantity of fluid in the uterine cavity. The period for parturition arrived without any signs of milk secretion or relaxation of the pelvis, and the abdomen measured thirteen feet in circumference. Symptoms resembling slight colic appeared which were not relieved by medicine, and the abdomen became so tense and hard that it was feared the muscular parietes would give way; strong bandages were therefore placed around the body, though through these having been fastened too tight, the mare fell apparently asphyxiated. However, on their being loosened recovery took place and her sufferings subsided so much that food and water were taken and general amendment seemed to have set in. Next morning, however, the unfortunate creature was found with an extensive rent in the right iliac region from which the small intestines escaped. It was destroyed and on opening the abdomen the uterus alone, with the exception of some portion of the small intestines, was the only organ visible, it being of extreme

dimensions and very pale and flaccid; it contained about twelve gallons of serous fluid, as well as two dead, but perfectly developed colt fetuses. These were of such a size that it was surmised parturition could not have been safely accomplished, even had there been no dropsy.

"Indications—The chief indication is to evacuate at least a portion of the fluid by rupturing the membranes, as medical treatment has always proved inefficacious. It must be remembered that the fetus is always dead; and even if alive, with the view of saving the life of the mother, it should be sacrificed. Though opening the amniotic sac and removing a certain quantity of the liquor need not necessarily compromise the existence of the fetus; as a case has been published by L'homme (Journal de Veterinaire du Midi, 1869) in which a portion of the fetal membranes protruded beyond the vulva, was excised without interfering with the ordinary progress of gestation; as when parturition occurred three months afterwards a well-formed mule was born and continued to live.

"The chances of success are greater as intervention takes place early and before the abdomen is excessively distended, the respiration not seriously affected and debility not great.

"The evacuation should be effected through the vagina, though it has been made through a puncture in the flank. If the membranes are in the vagina they may be ruptured by the fingers there; if not, and the os is sufficiently dilated for the admission of the hand, they may be ruptured in the uterus; if it is closed it should be gently dilated and the envelopes punctured if necessary, by means of a trocar and cannula. As soon as the membranes are pierced a gush of fluid takes place, the abdomen diminishes in volume, the uterus becomes retracted and in this retraction the fetus and membranes are sometimes expelled. Should this expulsion not take place soon they must be removed in the ordinary way. Afterwards the animal is to be carefully attended to and generously fed."

Investigators in the physiological laboratories of the University of Chicago severed the spinal cord of unborn rats that were later not only born alive but apparently normal, regeneration and repair having been complete. This is probably the first record of regeneration of injured or severed spinal cord in mammals.

Many commercial chick hatcheries are complaining about the large percentage of infertile eggs this spring, according to the directors of the International Baby Chick Association who met this spring with poultry specialists of the United States Department of Agriculture. Many of the hatches, they report, show that less than 75 or 80 per cent of the eggs available are fertile, whereas in normal years fertility runs as high as 90 per cent or more.

Pig losses have been reported from various sections of the country. There have been the usual losses from dietary scour, navel ill and parasitism, but there have been many reports of losses of pigs from one to thirty days of age that apparently were not due to the common maladies. Pigs dying of this latter condition show no evidence of disease on autopsy and the only symptom manifested is gauntness. In some cases these losses have occurred in the litter of sows that had an attack of swine flu during gestation. In other instances there is no history of flu. It may be possible that the cause of this malady is of dietary origin, but in most instances the feed is apparently of good quality and is properly balanced; however, there may be some deficiency in the feed traceable to unusual or abnormal soil or climatic conditions. To identify the cause of these pig losses is a problem that should be investigated in order that future similar losses can be avoided.

Alkali Poisoning of Livestock

M. R. MILLER, Chemist, Nevada Agricultural Experiment Station

IN SOUTHERN NEVADA the stockmen are confronted with a peculiar pathological condition of horses and cattle, known locally as "alkali poisoning." The condition found in the Pecos Valley (1) and termed the alkali disease of livestock, is not believed to be the same as that found in Southern Nevada. Among many of the local stockmen there is a belief that this condition is a result of the ingestion of salts found as surface deposits or incrustations of "white alkali" particularly where the soils are moist a part or all of the year. The losses nearly always occur among animals which graze on poorly drained pastures or low wet meadows.

The following description of the condition has been given by Dr. E. M. Dobbs (2) in a paper presented at a meeting of the California State Veterinary Medical Association held at Pasadena, California, December 29-31, 1924.

" . . . the symptoms shown by horses are not exactly the same as those exhibited by cattle. Sometimes horses are not affected at all.

"I find that cattle that are compelled to graze continually on alkali pastures and drink alkali water from drain ditches or seepage pools are the first to become affected and show the most typical symptoms. There are some men who believe that hay that has been grown on new land where alkali salts are abundant will, when fed to cows, cause them to scour, and display other symptoms similar to those exhibited by a so-called alkalied cow. Others will tell you that there are certain plants or shrubs that will cause an animal to become alkalied.

"Conditions are usually worse in the late fall and winter. Thirty days on a strongly alkalied pasture at this season of the year is generally sufficient time for an animal to become affected.

(1) C. D. Marsh and G. C. Roe, U. S. D. A., Circ. 180.
(2) Dr. E. M. Dobbs, Nevada State Board of Stock Commissioners.

"The clinical picture presented by a severe case is usually quite typical, although it seems to vary a little in some localities. An animal in fair flesh or one in poor condition may be affected, but usually the feed in these pastures is so poor that after an animal has been forced to remain on this kind of feed for thirty days it is in poor condition and consequently, it is only occasionally that we find an alkalied animal in good flesh.

"It is when an animal is being moved that symptoms are most apparent. He will begin to lag. His ears will droop and he will take on a haggard appearance, and will display other symptoms of extreme weakness. Before long he will show a disinclination to move at all, and will lie down. If you make him get up he will fight. Nervous symptoms appear. His head will shake from side to side and if he walks you will note that he steps high with his front feet. One cowboy compared a badly alkalied animal to a drunk man. He is always ready to fight, but due to a pronounced incoordination of movement and extreme weakness he is not dangerous. Usually he scours badly, but it is a noticeable fact that animals that have been taken off of alkalied pastures soon become badly constipated, and usually remain in this condition until placed on green feed. Another common symptom which is quite characteristic is the dribbling of small quantities of urine. A badly affected animal that has become excited will urinate almost constantly.

"If you are successful in moving the alkalied animal into a field where there is plenty of good green feed and an abundant supply of fresh water, the chances are that you will save him. I have found no other treatment to be of any value. Some stockmen will tell you that they have cured badly alkalied animals by giving them vinegar. There seems to be a difference of opinion as to the dose re-

quired. Some cow men will give a pint. Others will administer a quart at one dose regardless of the size of the animal. If the animal remains on the alkali long enough he will become greatly emaciated, his hair will become dry and harsh, and he will change color. A red animal will become a bright yellow. Hairless areas varying in size from a dollar to that of a good sized saucer are very commonly seen on animals that have been on alkali for a long time. The nude spot becomes hard and dry and resembles ring worm, Trichophyton tonsurans. Usually these spots appear on the leg in the region of the stifle joint and later on the abdomen. If you do not move him or at least supplement his ration it will not be many days before you will find him dead.

"Horses that are affected usually give about the same history and exhibit almost the same lesions as cattle, except that they die more suddenly. That is to say, when a horse that has been running on an alkalied pasture is caught up and put to work or exercised freely he will become ill and die within a few hours. On the other hand, if he is permitted to remain on the pasture he may not show any ill effects whatever; and when the green grass starts in the spring he will be in fair condition, and when called upon he will be able to do a reasonable amount of work."

In many localities, especially where the soils are moist, the crystalline salts creep up the stems of the vegetation for a distance of several inches in some cases, and are believed to be taken into the system with the plants in grazing by stock. At certain seasons of the year, there are accumulations of surface water in shallow basins, these serving oftentimes as watering places until they become dried up. The water, feeding these water-holes, dissolves much of the surface salts and carries them to the basin and in this way, too, the white alkali becomes available to the stock using the basins as watering places. Many other waters, as from streams, springs, and seepages, used by horses and cattle, carry the soluble salts common to the region, sometimes in excessive quantities, which are added to those already taken in by the animals. It is interesting to note, in connection with the reference made by Doctor Dobbs to the supposed effect of alfalfa hay grown on alkali areas, that in nearly all cases the alkali salts were at the same time available to the stock from other sources than from the hay.

While there is no assumption that the chemical composition of the white alkali deposits and of the dissolved matter of the waters differs any more widely than usual from that of the alkalies of other similar arid regions it was considered that chemical examination of the alkalies and waters might give a clue to the relation of the disease to the abundance of salts. The results of the examinations made are here given. The author, however, will not here attempt to correlate the chemical composition with the pathological condition except in so far as might be the general effect of the ingestion of large quantities of common salts.

Samples were taken in several areas in which the alkali poisoning had occurred and which many of the cattlemen attempt to avoid on account of the popular supposition that in these areas there was greater danger. The samples were taken in the vicinity of Las Vegas, Pahranagat Valley, Panaca Valley and Moapa Valley. They were taken where the "best" alkali could be obtained, both where vegetation existed and where there was none. The water samples were taken from springs, seepages and other sources to which livestock had and did not have access. These samples were examined for the amounts of common bases and acids they contained, the methods used, in general, being those used in the work reported by R. B. Dole(3).

The samples of alkali, air dried and pulverized, were leached with water, the solution made to volume and aliquots examined in the same manner as were the

(3) R. B. Dole, U. S. G. S. Water Supply Paper No. 236.

water samples. In order to make the results comparable a standard procedure was adopted in which 10 g. of the pulverized sample was shaken in a bottle with 500 cc. of water for a definite length of time and the solution filtered off, clear, for use.

The results obtained on the alkali samples are reported as percents of the air dried alkali sample as weighed for leaching. The constituents of the water samples are reported as parts per million. The summation of the bases and acids, determined and calculated, only approximated the values found in each case after the organic matter of the residue on evaporation had been charred below redness. Consequently the figures for the total of determined and calculated bases and acids are given for total dissolved solids.

In Table I there is given a short description of the samples and a note as to the locality from which the samples were obtained.

In Table II are given the results of the chemical examination made on the samples.

TABLE I

DESCRIPTION OF SAMPLES

No.	Sample	Source and Remarks	
		LAS VEGAS VALLEY	
470	Alkali	J. F. Miller ranch	White soil incrustation
471	Alkali	J. F. Miller ranch	On grass stems, near No. 470
472	Water	J. F. Miller ranch	Seepage below reservoir
473	Alkali	J. F. Miller ranch	Brown deposit on soil
474	Water	J. F. Miller ranch	House tap, artesian water
475	Water	J. F. Miller ranch	Seepage below reservoir
476	Water	J. F. Miller ranch	Accumulation of all seepages
477	Alkali	Old R. R. Shops Site	White soil incrustation
478	Alkali	Old R. R. Shops Site	Brown soil incrustation
479	Water	Old R. R. Shops Site	Seepage water hole
480	Water	Filliby ranch	Flowing artesian well
481	Alkali	Buol ranch	White soil incrustation
482	Alkali	Buol ranch	White soil incrustation
		"VALLEY OF FIRE"	
483	Alkali	Road near petrified trees	White soil incrustation
		MOAPA VALLEY	
540	Water	Muddy River	Bridge at St. Thomas
484	Alkali	Below Overton	Brown soil incrustation
485	Alkali	Below Overton	Brown soil incrustation
486	Alkali	Below Overton	Dried-up water hole
487	Alkali	Below Overton	Near small seepage
488	Water	Near Morrison ranch	Water hole
489	Alkali	Near Morrison ranch	Moist, grass stem deposit
490	Alkali	Morrison ranch	White soil incrustation
491	Water	Morrison ranch	Seepage
492	Alkali	Morrison ranch	White soil incrustation
493	Alkali	Morrison ranch	Reddish soil incrustation

No.	Sample	Source and Remarks	
494	Alkali	Near Overton	White soil incrustation
495	Alkali	Near Overton	Moist, grass stem deposit
496	Alkali	Near Overton	White soil incrustation
497	Alkali	Gyp. Mill, E. side R.	White soil incrustation
498	Alkali	Gyp. Mill, W. side R.	White soil incrustation
499	Water	Near Ovard ranch	Small seepage water hole
500	Alkali	Beath ranch, S. end	White incrustation near water hole
501	Alkali	Beath ranch, S. end	Same
502	Water	Beath ranch, S. end	Seepage water hole
503	Water	Muddy River	Bridge near Beath ranch
504	Water	Beath ranch	Water-hole in unused pasture
505	Alkali	Beath ranch	White soil incrustation
506	Alkali	Beath ranch, Range	White soil incrustation
507	Alkali	Beath ranch, Range	White soil incrustation
508	Alkali	Beath ranch, Range	White soil incrustation
509	Alkali	Moapa Reservation	Near Supt's house
510	Water	Ovard ranch, upper	Stagnant water hole
511	Alkali	Ovard ranch, upper	White soil incrustation
514	Alkali	Ovard ranch, upper	Surface soil
		PANACA VALLEY	
520	Water	Slough, near bridge	High water, melting snow
521	Water	Yocum ranch	Water hole fed by springs
522	Water	Yocum ranch	From near No. 521
523	Alkali	Yocum ranch	Incrustation
		PAHRANAGAT VALLEY	
515	Alkali	Nesbit ranch, Hiko	White soil incrustation
516	Alkali	Castles' ranch	White soil incrustation
517	Water	Hiko	Water hole
518	Alkali	Hiko, 1 mile north	Red-brown incrustation
519	Alkali	Hiko, 1 mile north	Grass stem deposit
524	Water	Theriot ranch	Seepage hole
525	Alkali	Theriot ranch	White soil incrustation
526	Alkali	Theriot ranch	Brown colored incrustation
527	Alkali	Theriot ranch	White soil incrustation
528	Alkali	Gardner ranch	Incrustation
529	Alkali	Gardner ranch	Incrustation
530	Alkali	Below Grove ranch	White soil incrustation
531	Alkali	Below Grove ranch	Brown colored incrustation
532	Water	Lower Gardner ranch	Water hole
533	Alkali	Lower Gardner ranch	White soil incrustation
534	Alkali	Lower Gardner ranch	Grass stem deposit
535	Alkali	Lower end of valley	Alkali flat
536	Water	Lower end of valley	Outflow of valley
537	Alkali	Cottonwood springs	Moist brown incrustation
538	Alkali	Cottonwood springs	White incrustation
539	Water	Cottonwood springs	Lower Pahranagat Valley

TABLE II

COMPOSITION OF ALKALIES AND ALKALI WATERS OF SOUTHERN NEVADA

Waters—parts per million
Alkalies—per cent of air dry sample

No.	SO_4	Ca	Mg	Cl	CO_3	HCO_3	Na	NO_3	Total
470	13.98	1.98	2.79	7.05	.....	0.17	3.76	.....	29.73
471	27.55	2.28	0.40	4.30	0.36	0.90	13.22	.....	49.03
472	1600.00	429.10	166.40	217.10	.....	320.10	220.30	.....	2953.00
473	40.77	6.97	1.91	5.33	.....	0.34	11.48	0.0100	66.81
474	498.70	166.50	52.40	70.10	2.40	212.60	76.00	.....	1078.70
475	2222.00	518.00	268.60	306 60	.....	381.20	304.20	.....	4000.60
476	519.30	64.90	105.20	168.70	55.20	847.90	446.40	.....	2207.60
477	34.91	1.92	2.23	1.93	.....	0.39	11.66	.....	53.04
478	3.59	0.07	.....	2.09	2.70	4.43	6.74	0.0100	19.63
479	7224.00	1301.00	894.00	1218.00	28.80	715.90	1357.00	.....	12738.70
480	39.50	57.80	18.70	11.00	21.60	238.20	30.50	.....	417.30
481	11.75	0.66	0.79	2.56	.....	0.41	5.19	0.0002	21.36
482	11.22	0.57	0.65	1.62	.....	0.35	4.67	0.0100	19.09
483	13.86	0.32	0.82	0.33	0.23	.....	5.02	0.0210	20.60
484	21.20	0.76	0.34	2.87	.....	0.41	10.63	0.0050	36.21
485	21.97	0.90	0.59	4.86	0.02	0.40	11.68	0.0070	40.42
486	2.11	0.56	0.10	1.46	.....	0.21	1.18	.....	5.62
487	9.15	1.30	0.22	2.01	.....	0.20	3.83	.....	16.71
488	6769.00	547.70	731.60	2640.00	43.20	232.10	3061.00	.....	14024.60
489	56.63	0.51	5.45	11.84	.....	0.93	24.23	.....	99.59
490	33.58	0.75	1.69	5.33	0.07	0.29	15.63	0.0160	57.35
491	2641.00	341.60	216.60	828.50	19.20	218.70	1097.00	.....	5362.60
492	0.80	0.40	.....	7.02	.....	0.20	4.56	.....	12.98
493	3.11	0.47	0.40	3.84	.....	0.20	2.75	.....	10.77
494	14.79	1.36	0.39	6.72	.....	0.19	9.21	0.0030	32.66
495	4.25	0.08	0.16	0.17	0.02	0.10	1.78	.....	6.54
496	14.48	0.65	0.27	3.01	0.02	0.19	7.73	0.0290	26.37
497	15.97	2.43	1.12	7.33	0.06	0.31	7.65	.....	34.87
498	29.28	1.73	2.13	5.01	.....	0.30	11.37	.....	49.82
499	1411.00	443.20	73.30	245.40	12.00	156.30	255.50	.....	2596.70
500	36.44	1.17	2.53	14.48	0.04	1.02	21.11	0.0050	76.79
501	49.79	0.84	1.99	5.11	.....	0.73	22.59	.....	81.05
502	3427.00	213.10	356.80	1389.00	72.10	317.60	1798.00	.....	7573.60
503	198.30	81.80	34.50	79.80	15.60	287.10	107.70	.....	804.80
504	204.90	84.60	35.80	87.60	40.80	234.50	109.70	.....	797.90
505	29.13	0.45	1.72	3.92	0.04	0.52	12.05	.....	48.73
506	35.07	0.47	0.42	3.68	0.31	0.36	18.19	.....	58.50
507	58.40	0.64	0.90	4.00	0.26	0.32	28.42	.....	92.94
508	12.11	0.11	.....	4.97	0.85	1.55	10.14	.....	29.73
509	8.91	1.01	0.34	4.74	.....	0.21	5.65	0.0870	20.94
510	45981.00	5571.50	7949.30	764.70	120.10	1004.30	1555.30	.....	62946.20
511	33.58	2.17	1.37	3.17	0.19	0.23	13.27	.....	53.98
514	8.72	2.35	0.05	0.19	0.03	0.14	1.56	.....	13.04
515	15.28	0.79	0.63	0.47	.....	0.26	5.61	0.0003	23.04
516	3.40	.....	.....	0.44	4.68	7.51	8.35	0.0250	24.40
517	102.80	65.20	88.70	42.70	24.00	510.70	45.00	.....	879.10
518	7.90	0.17	.....	2.13	3.91	6.65	10.66	0.4300	31.85
519	25.57	0.97	1.07	0.86	0.02	0.39	9.79	.....	38.67
520	70.70	65.20	17.90	59.60	33.60	320.10	110.10	.....	677.20
521	26.30	52.70	39.30	54.00	19.20	344.50	57.40	.....	593.40
522	43.50	52.70	16.50	36.00	16.80	215.00	41.90	.....	413.40
524	162.90	57.70	78.60	72.00	48.00	422.70	126.00	.....	947.90
525	1.09	.....	.....	0.20	0.96	0.87	1.75	0.0070	4.87
526	13.39	.....	.....	2.49	12.37	16.98	23.93	0.0250	69.18
527	2.96	.....	.....	1.73	1.06	2.04	4.13	0.0210	11.94
528	2.75	.....	.....	2.81	0.15	1.05	3.79	0.3600	10.91

NEVADA STATE AGRICULTURAL COLLEGE LIBRARY MAY 28 1926

No.	SO_4	Ca	Mg	Cl	CO_3	HCO_3	Na	NO_3	Total
529	3.16	.....	.....	4.38	1.05	1.91	5.90	0.0300	16.43
530	4.19	0.08	.....	0.36	0.42	0.83	2.78	0.0180	8.67
531	0.96	0.03	.....	0.46	1.48	2.25	2.73	0.0870	7.99
532	599.10	151.80	138.40	144.00	409.80	489.00	442.70	.....	2374.80
533	8.99	0.36	0.22	2.09	.....	0.35	4.95	0.0200	16.98
534	29.90	1.30	2.63	2.88	.....	0.83	10.02	0.0310	47.59
535	4.19	0.15	.....	4.45	4.07	7.13	10.54	.....	30.53
536	1483.90	296.50	150.60	209.30	.....	287.20	214.40	.....	2741.90
537	20.45	0.25	0.16	3.33	20.93	19.69	34.82	.....	99.63
538	31.11	2.58	2.10	1.50	0.11	0.73	9.28	.....	47.41
539	121.80	57.70	41.40	72.00	34.50	530.70	186.80	.....	1044.90
540	469.90	116.70	56.30	193.50	42.00	313.60	260.50	.....	1452.50

Aside from the presence, to a small extent, of nitrates in the alkali samples, it is difficult to show that the "alkali poisoning" is due to any specific constituent available in the alkali or water. However, the continual ingestion of excessive quantities of common salts might in itself be conducive to the condition through a derangement of the metabolic processes of an animal. In connection with this, too, must be considered the fact that in many cases the feed available is not of the kind which would permit an animal to become more resistant to such adverse factors as extremely large quantities of soluble salts.

The author wishes at this time to thank Dr. E. M. Dobbs, of Las Vegas, and Mr. C. E. Fleming in providing transportation and assistance in the collection of the samples.

Summary

1. Horses and cattle of certain areas of Southern Nevada are subject to a pathological condition known locally as "alkali poisoning."

2. This condition is locally attributed to the abundance of salts ingested with the feed and water.

3. The content of common salts found in alkalies and waters of these areas have been reported.

4. The presence of the large quantities of common salts in the waters and with the food of the affected animals may explain the condition on the basis of disturbed metabolism.

Butterfat in cow's milk is increased approximately .2 per cent for each ten degrees lowering of temperature from 70° to 30° F.

Tularemia is transmissible to man by blood sucking flies and ticks that are infected with B. tularense, the causative agent of that disease.

The prevalence of xerophthalmia in children is in direct proportion to the consumption of butterfat—vitamin A. The use of butter even though higher in price than some of the substitutes is therefore justifiable.

Salmon and other sea foods have a relatively high iodin content and are therefore of considerable value in the prevention of goiter. The iodin is available and utilizable in canned salmon.

A slow horse or mule is an aggravation to the driver. These may be kept in place by the use of dried peas in a light air rifle with the compression cut down, according to Wayne Dinsmore.

Deficiency of vitamin A in feed is evidenced by failure to grow, xerophthalmia, respiratory and digestive disorders. White corn, dried beet pulp, and powdered skim milk, oxidized by exposure to light and air, are practically free from vitamin A. Codliver oil should be provided for animals fed a ration deficient in vitamin A.

American Medical Association

Gleanings from the Seventy-Seventh Annual Session, Dallas, April 19th to 23rd

About 6,000 physicians were in attendance.

Dr. Jabez N. Jackson of Kansas City, Mo., was elected president.

Complete eradication of measles, whooping cough, scarlet fever, possibly all the eruptive diseases, as well as all the insect-borne plagues, was predicted as a development of the future by Dr. Wendell C. Phillips, who spoke on preventive medicine and public health.

A report on the survey of the mortality statistics of diphtheria showed that in 1910-14 only thirteen cities averaged death rates under 10 per 100,000; in 1915-19 only eighteen cities could be so classed; but in 1924 there were thirty-seven and in 1925 forty-nine with diphtheria death rates lower than had ever been known before 1910. This decrease in the death rate is attributed to the practice of immunizing school children with toxin-antitoxin mixtures or with anatoxin.

The active principle of the ovary, or female sex gland, is now being used in treating women for several different diseases, according to Dr. J. P. Pratt of Detroit, and Dr. Edgar Allen of the University of Missouri, who gave a report of their observations on the ovarian hormone. It is believed that this substance has an influence on the periodic functions of women.

Injection of chemicals and certain dyes directly into the veins is useful in combating generalized infections according to Dr. Hugh B. Young of Baltimore. Hundreds of successful treatments were cited involving affections such as boils, erysipelas, infections of the joints and abscesses.

Deaths from cancer of the stomach, according to Dr. George B. Eusterman of the Mayo Clinic, are due largely to the fact that over half of the people so afflicted wait until it is too late for an operation before they consult a physician. Eighty per cent of the patients are men, while over sixty-five per cent of them are from fifty to seventy-five years old.

A method of preparing the recently discovered liver extract for use in reducing blood pressure was described by Drs. A. A. James, N. B. Laughton, and A. B. Macallum of London, Ontario. They have succeeded in purifying this substance and freeing it from dangerous chemicals. When injected into the body there occurs a rapid fall in blood pressure more pronounced and of longer duration than can be induced by any other known drug.

Another substance "guanidine," which produces a rise in blood pressure when injected into the body, was described by Dr. Ralph C. Major of Kansas City.

Dr. Joseph L. Miller of Chicago, pointed out that there are many types of blood pressure that are due to changes in age and in these cases high blood pressure is possibly a necessary phenomenon.

Vertigo and dizziness were described by Dr. D. W. Drury of Boston, as ills to be treated by psychanalysis.

That the importance of vitamins may be overlooked by patients on special diets, was brought out by Dr. Michael Wohl of Omaha, who showed that grave danger

may result in diabetes cases when the necessarily restricted diet fails to include vitamins A and B.

In persons with disturbances of the joints, Dr. Ralph Pemberton of Philadelphia, had found a low tolerance for sugar and pointed out that the amount of sugar digested in the body has a well defined relationship to inflammation of the joints. He believes that control of sugar digestion is a factor in healing such diseases. The condition is not the same as in diabetes but seems to depend on some changes in the circulation of the blood.

Cancer is on the increase in the lungs as well as in all the other organs, according to a report by Drs. John A. Lichty, F. R. Wright and E. A. Baumgartner of Clifton Springs, N. Y., but it occurs proportionately less often in the lungs than in any other organ. They stated that there is no proof that the influenza epidemic has contributed to increased cancer of the lungs.

That many people have developed immunity to infantile paralysis through having been mildly infected, was set forth as a possibility by Dr. W. L. Aycock of Boston, who said that while the disease spreads from person to person, it may also be transmitted by indirect methods.

Iodin as a Cure for Foot-and-Mouth Disease

IN VETERINARY BULLETIN No. 17, recently issued by the Department of Agriculture, Punjab, India, Colonel G. K. Walker, C. I. E., O. B. E., F. R. C. V. S., Principal and Professor of Medicine, and W. Taylor, M. R. C. V. S., D. V. H., Professor of Pathology, of the Pubjab Veterinary College, under the title "Foot-and-Mouth Disease—Control by Chemotherapy," describe their experiments in the treatment of this affection. The following excerpts are taken from the bulletin, which also contains detailed records covering each animal involved, eleven calves having been experimentally inoculated with the foot-and-mouth disease virus and an equal number used as controls.

"Laboratory research has revealed some valuable knowledge in connection with the transmission of the virus by artificial methods though no accurate information is yet forthcoming in regard to the way by which natural infection usually takes place. A satisfactory virus having been obtained, the experiments now recorded have been conducted with a definite objective based on the knowledge that the first symptom of foot-and-mouth disease is thermal and precedes the appearance of the primary eruptions. This rise in temperature is very marked when thermometrical readings are conducted, but feverish symptoms are otherwise easily overlooked. The thermal stage is usually followed by the primary eruptive stage in 8 to 24 hours.

"It was anticipated that if the normal course of the disease could be arrested at the thermal stage by means of a suitable therapeutic agent a practical and inexpensive method of controlling outbreaks might be evolved. In addition, if it were found that the abortive febrile stage, in itself, proved sufficient to produce even a short period of immunity, the method would possess further advantages.

"The virus used in the experiments was obtained from a cow in Hissar City showing a temperature of 105°.4 on the morning of February 1st, by bleeding from the jugular vein, 400 cc. being taken. At 1 p. m. this cow developed large ves-

icles on the tongue and on the lower lip. The contents of these were taken and mixed with normal saline solution. The epithelium of the vesicles was removed subsequently and preserved in 50 per cent glycerin with distilled water. At the time of injection, the blood, the diluted vesicle contents and the epithelial material, emulsified in normal saline, were mixed together. A guinea pig was inoculated with this mixture intracutaneously in the pad and developed typical lesions of foot-and-mouth disease. The cow went through a normal course of the disease and recovered.

"In each experiment, with one exception, two animals (weaned calves) were used, one for treatment and one for control. In one case three animals were taken, one being kept as control and the other two treated. In the first experiments hill animals were used on the assumption that they were likely to be more susceptible than plains animals, but later it was found that plains animals proved equally susceptible to this particular virus. After the period of incubation and during the thermal stage, each animal to be treated received Lugol's solution of iodin intravenously. With a view to determine the requisite dose, various quantities of the solution were tried, starting with what was considered to be the largest dose likely to be tolerated. During the course of the experiments guinea pigs were inoculated with the virus used and in every case typical lesions were produced.

"The solution used in all the experiments was iodin, one gram, potassium iodid, two grams, distilled water, 300 cc. It was found that doses of over 100 cc. were not always tolerated though one animal received 300 cc. and survived. The dose that is recommended is from 50 to 100 cc. according to the size of the animal. In one case 30 cc. proved to be effective. The most convenient method of administration is by means of a syringe. When dealing with restive animals a funnel was found to be inconvenient.

"In order to determine if the rise in temperature conferred immunity all the treated animals were exposed to natural infection and, in addition, inoculated intravenously with virulent blood at varying intervals ranging from one to twenty-four days after the injection of iodin as noted in the records. In no case did any symptoms of foot-and-mouth disease appear, showing that considerable immunity had been conferred. The infectivity of the virus was verified by obtaining positive results in controls.

"From the experiments it appears that the conclusion is warranted that cattle infected with foot-and-mouth disease can be cured in the febrile stage by the intravenous injection of Lugol's solution of iodin, and that such animals will not develop eruptive lesions if the treatment is adopted in time. Contrary to the findings of the Departmental Committee, it was observed that there was always a decided rise of temperature before lesions appeared. It appears, moreover, that considerable immunity is attained, but whether this immunity is as active as the immunity which follows an attack allowed to pursue its normal course, must be a matter for further experiments. It is well known that immunity in natural cases is very variable and not often absolute. The period of infectivity, if it exists at all, in animals treated by this method, must be very short as it seems fair to presume that if no eruptive lesions occur the disease is unlikely to be conveyed by natural infection. This point affords a field for some interesting experimental work later.

"With regard to the experiments in which Lugol's solution was injected previous to inoculation with virus, it was observed that, although the temperatures of the animals rose to heights varying from 103°.6 to 105° and remained in that vicinity for several days, the eruptive stage was much delayed, more particularly in two cases.

"It appears therefore that the intravenous injection of iodin attenuates the virus if the inoculation of virulent blood

FEDERAL STATE MAY 28 1926

takes place within two days of the injection. As this observation is dependent on one experiment only it may be regarded as tentative pending the result of further experiments on the same lines.

"Consequent on a consideration of the results recorded, which appear to be extremely significant, and, if confirmed, in the field, of far reaching economic importance, it is suggested that outbreaks of foot-and-mouth disease in cattle may be dealt with in the future by treating animals in the febrile stage by the intravenous injection of Lugol's solution of iodin. In a case in which iodin was administered late and vesicles had appeared, treatment was found to have a good effect. On the occurrence of a case of the disease, the ideal method would appear to be to ascertain and record the temperatures of all the contact animals twice daily and treat those which show a rise above normal. If for certain reasons it is not possible to take thermal readings, it is suggested that all the contact animals be injected with iodin, but, as the experiments show, no appreciable immunity would be conferred and this method should only be used as a safeguard pending the adoption of the former. Another proceeding worthy of consideration is to inoculate all contact animals with virus and inject them as soon as their temperatures rise with a view to confer immunity.

"Cases showing primary vesicles may be regarded as infective and it has been shown, in one case, that, even so, the course of the disease can be arrested and therefore, if all contact animals showing temperatures are treated, those which have developed eruptive lesions may be regarded as having completed all the harm they can do and need not be slaughtered.

"The experiments so far conducted show that animals which have had a rise of temperature and have been treated with iodin become immune for at least twenty-four days. This is very satisfactory so far as it goes, but nevertheless the advisability of reinoculating the treated animals with further doses of virus with the view of increasing their powers of resistance and extending the period of immunity is a matter for consideration.

"Measures directed to the thorough disinfection of all possible or probable sources of infection and the destruction of all soiled fodder, litter and vermin are indicated in order to prevent future infection.

"The experiments now recorded show that outbreaks of foot-and-mouth disease in cattle may be dealt with effectively and economically in the future by therapeutic treatment.

"It is considered that the importance of the subject justifies the early publication of the results so far obtained in order that further experimental work by others may confirm or dispute the conclusions already arrived at. If the above simple method of treatment, which has so far never failed, is found to be capable of superseding wholesale slaughter, a serious economic problem will be solved. Additional advantages are that the treated animals show no obvious lesions of foot-and-mouth disease, their general health is little affected, and there is no appreciable loss in weight and condition.

"Iodin is very rapidly eliminated from the system and the amount used is unlikely to have any harmful effect on flesh or milk. The treatment can be conducted easily by professional men and at relatively small expense."

Americans are meat eaters. The per capita consumption in the United States of all meat, excepting lard in 1925, was 154.3 pounds. Total beef consumed in 1925 was 63.1 pounds, a larger amount than for any previous year.

The successful elimination of internal parasites gives temporary relief to the infested animal but is of little value in controlling the condition unless re-infestation is prevented by destroying the expelled parasites and placing the treated animals on soil that is not infected.

The Use of Milk in the Treatment of Human Disease*

J. E. CREWE, M. D., Rochester, Minn.

WHILE MILK is widely used and recommended as an article of diet, it is seldom used by regular physicians exclusively as an agent in the treatment of disease. For fifteen years the writer has employed the so-called milk treatment in various diseases and during the past ten years has had a small sanitarium devoted principally to this treatment. The results obtained in various types of illness have been so uniformly excellent that one's conception of disease and its alleviation is necessarily modified. The method itself is so simple that it does not greatly interest medical men and the main stimulus comes from the patients themselves. The fact that many diseases are treated and successful results claimed, leads almost to disrespect. However, this fact, while it is regretted, is not necessarily discouraging. The reasons are basic, and in accordance with established facts.

In a paper read at the Mayo Clinic Staff Meeting, in 1916, the writer made the following statement: "Speaking broadly, we may say that most diseases are due to poisoning from pathologic bacteria, from faulty elimination of the toxins generated in the body tissues, or from defective blood or defective circulation, resulting in malnutrition of certain tissues or parts of the body. Obviously, then, to cure disease we should seek to improve elimination, to make better blood and more blood, to feed the tissues, to destroy the invading bacteria, to quickly remove bacterial and other toxic products, and to build up the body resistance." The method used, tends to accomplish these things. Blood conditions rapidly improve and the general condition and resistance are built up and recovery follows.

In several instances Osler speaks of milk as being nothing more than white blood. The cow's udder is filled with blood which is converted into milk during the milking process. Milk resembles blood closely and is a useful agent for improving and making new and better blood. Blood is the agent in the body that feeds the tissues, each cell, and also acts as scavenger to carry off and eliminate waste and toxic products. In other words, blood is the chief agent in metabolism. Milk is recognized in medical literature almost exclusively as a useful food and is admitted to be a complete food. Practically its only recognized use as the sole curative agent is in the treatment of nephritis by the Karrel method, which advises the use of six and one-half ounces of milk four times a day, or twenty-six ounces.

The method advocated employs milk in much larger quantities. The patients are put at rest in bed and are given at half-hour intervals from five to ten quarts of milk a day. Very rich, raw Guernsey milk is used for the most part, but Holstein and various modifications are sometimes used. Also the patients are given orange juice in the morning and at night a dish of prunes or lettuce or sauerkraut. Three quarts of milk are more than equal to the amount of food required by a person of average weight, at rest, in a day; therefore, the number of quarts above this amount can be used for other purposes than mere maintenance. Most patients are started on three or four quarts of milk a day and this is usually increased a pint a day until six or eight quarts are being taken. The Weir Mitchell idea is followed and the patients are kept at rest in bed. Elimination is promoted by increased diuresis due to the large quantity

* From Proceedings of the Twenty-ninth Annual Meeting of the U. S. Live Stock Sanitary Association, held at Chicago, December 2-4, 1925.

STATE AGRICULTURAL COLLEGE MAR 29 1926

of milk taken, and diaphoresis is stimulated by hot baths and hot packs and heat in other forms. A daily enema is given, but cathartics are rarely used or needed. It is quite likely that practically the same things could be accomplished with a proper selection of other foods, but milk can be given in larger quantities and is a balanced food and is aided by the addition of the orange juice, etc. The treatment is used in many chronic conditions, but chiefly in tuberculosis, diseases of the nervous system, cardio-vascular and renal conditions, hypertension, and in the patients who are underweight, run down, etc. Perhaps the most striking results are had in the treatment of pulmonary tuberculosis, and other forms also. Briefly the method is much the same as that used in other diseases, but several points should be stressed. All cases are kept absolutely at rest in bed for a period depending upon the extensiveness of the lesion. Rest is not given in rest periods as is usually done, but is continuous twenty-four hours a day. After the initial period of complete rest, the patient is gradually allowed to be up, and later graduated exercises are begun, following the method of Marcus Paterson of Brampton Hospital, England. Recently a quotation from Marcus Paterson from the London Lancet was seen. "He suggested that the term night sweats is a misnomer and should be changed to slumber sweats, as the sweating may occur at any time when the patient sleeps. He states that in the early stages of pulmonary tuberculosis and in the absence of any other infection, the sweats are often the only indication of the presence of an active tuberculosis. They do not occur a few weeks before death because the patient's resistance has been overcome. Various drugs have been recommended for slumber sweats, but these are unnecessary, as the sweats can be prevented without drugs, simply by having the patient sleep on a grass mat over the mattress or by sleeping without a mattress on canvas. The sweats are due to the presence of large amounts of bacterial products (toxins) in the blood; the sweats may appear in any bacterial disease and consequently they are not diagnostic of pulmonary tuberculosis, as is generally believed."

The treatment used since 1914 recognizes this fact and these patients are given hot baths and sweats daily or on alternate days. These patients are refreshed by the sweating and will not willingly do without the sweats. They do not have the so-called night sweats. Gains of from four to seven pounds a week are the rule. The sputum becomes more liquid at first, disappearing later, and the cough is soft and easy. Hemorrhage is rare. Improvement in every way is rapid and is notable even in advanced cases.

Another class of cases in which striking results are seen are diseases of the heart and kidneys and high blood pressure. The treatment of this class of patients is given in a paper presented to the Minnesota State Medical Society in 1923. This cannot be gone into in detail at this time, but most striking results are had.

In cases in which there are marked edema, the results obtained are surprisingly marked. This is especially striking because so-called dropsy has never been treated with large quantities of fluid. With all medication withdrawn, one case lost twenty-six pounds in six days, huge edema disappearing from the abdomen and legs, with great relief to the patient. No cathartics or diuretics were given. This property of milk in edema has been noted in both cardiac and renal cases.

Patients with cardiac disease respond splendidly without medication. In patients who have been taking digitalis and other stimulants, the drugs are withdrawn. As in tuberculosis, rest in bed is very important in the treatment of cardiac disease, but milk as given is undoubtedly a very important factor. Caution, of course, is observed in giving sweats, but this form of elimination is used.

High blood pressure patients responded splendidly and the results in most instances are quite lasting. The results in

this class of cases have been especially satisfactory.

Weir Mitchell was very enthusiastic over the good effects in many nervous conditions obtained by his rest cure. Milk, in itself, seems to have a sedative effect, and with the rest in bed most satisfactory results are had. Equally good effects are had in other conditions, but they will not be enumerated.

The treatment has been used successfully in obesity without under alimentation. One patient reduced from 325 pounds to 284 in two weeks on four quarts of milk a day, while her blood pressure was reduced from 220 to 170. It was necessary to give some patients much smaller amounts in order to reduce. It may be said, however, that tissue change is marked in some conditions where it can be observed, as in tuberculous glands and ulcers, goiters and varicose veins. Some extremely interesting results have been obtained in a few cases of diabetes, but as some special work by this method is now in progress by the writer and some other observers, it is not desirable to make a report now.

Fifteen years of seeing patients rapidly and satisfactorily getting well from various diseases by this simple method has inspired the writer with the realization that disease and methods of curing it is a much simpler matter than our present complicated practice of medicine would lead one to believe. With the wonderful advance made in medical science in recent years there should be much less disease, and people should attain greater age. We are told that the span of life is rapidly increasing, but statistics obtained from the Bureau of Census do not bear this out to any extent. It is true that the average length of life has somewhat increased, owing chiefly to better care of infants and a greatly lessened infant mortality which brings up the average, but after the age of 30 the life expectation increases but little and in the advanced ages the life expectancy was greater twenty years ago than now.

An immense amount of excellent work is being done and vast amounts of money are being spent in the science of medicine, but disease still takes its toll and we can scarcely help but wonder what blocks the way of medical progress and defeats in a measure those who are so earnestly seeking to eliminate disease and suffering.

It is strange that so little thought is given to the lives of certain primitive people who are said to live with but little disease. That this is so, is attested by numerous writers. Major McCarristan, who spent nine years in the Himalayan Mountains in Northern India, stated that tribes there were long-lived and retained their youthful appearance till late in life, and that he saw very little disease of any kind, no stomach or intestinal disease and no cancer. He attributed their fine condition to their simple food, consisting of fruits and vegetables and milk products. Outdoor life was probably also a factor. But the Esquimeaux spend much of their lives in close, overheated igloos, and also had little disease before white men brought tuberculosis to them. Their diet was mostly meat and fish. Stefansson has written interestingly about these matters. He also tells of how he and several companions traveled over the frozen Arctic seas for nine months, living entirely on fish and seals, polar bears and caribou. During these months they underwent the severest hardships; most of the food was eaten raw. None of them was ill until on the return journey they found at Herschel Island a store of food left by a previous explorer. This food had been placed in a little stone hut and was well preserved, and consisted of salted meats, preserved fruits, vegetables, flour, etc. The men were eager to eat civilized food again and ate heartily of this food for several days, against Stefansson's advice. Soon they began to suffer from sore mouths, loose teeth and diarrhea, symptoms of scurvy. The food had been in storage six years. Stefansson immediately placed them on a diet consisting mostly of raw caribou tongue and in a few days they recovered.

Charles Darwin spent five years in South America in 1831-1836, studying the people and fauna of that country. He stated that the Fuegians along the Straits of Magellan were of splendid physique, averaging six feet in height. They were able to endure severe exposure with scanty clothing. Their food consisted almost entirely of shell fish and a kind of fungus that grew there. Magellan also has written of the giants he encountered as he entered the Straits that bear his name. The people in Western Argentine, he observed, lived almost exclusively on meat, averaging about five pounds a day, while across the Andes the people do not raise stock but live almost entirely on vegetables.

In 1887 Henry M. Stanley went to rescue Erwin Pasha in Central Africa. Erwin Pasha had been sent by the British government to establish an empire in Central Africa. The tribes in the north became engaged in a religious warfare and controlled the Nile, which was the only highway into Central Africa at that time. It was feared that Erwin Pasha and his men would be either starved or massacred by the tribesmen, and Stanley was sent to rescue them. He was obliged to enter on the west coast and travel up the Congo under the equator. He had five or six hundred bearers carrying ammunition and supplies. The negro bearers were fed upon what the country supplied. They lived mostly on manioc roots, from which our tapioca is made, and bananas. They were in good health and spirits so long as they had an abundance of this sort of food, although carrying burdens of from forty to eighty pounds through swamp and jungle in a tropical region. They suffered only when little or no food could be obtained.

Livingston wrote that he was able to subsist upon what the country provided, but that he got along much better when he was able to have cows or goats with the caravan so that he could have milk.

The foregoing seemingly foreign matter has been given to show that many different primitive people managed to get along on various types of food, but that it was natural food, mostly raw. Numerous other examples could be shown, but these brief citations are given to show that peoples who live on the simplest foods have little disease. It would seem to indicate that an excess of vitamins is an important element in maintaining health.

When sick people are limited to a diet containing an excess of vitamins and all the elements necessary to growth and maintenance, they recover rapidly without the use of drugs and without bringing to bear all the complicated weapons of modern medicine. In other words, there should be but little disease. It was not in the original scheme of nature. Nature has been able to adapt herself to many things, but tin cans, automobiles and steam-heated homes and various other modern practices are too much and as a result we have loss of resistance to practically everything. We cannot breathe horse dust or pollen and we have all the allergies. Science is cunning in providing the remedies for these things. We have insulin but we should not have diabetes, and so on. From a recent book on dietetics, the following is quoted: "If an aboriginal textbook on medicine could be found, it would probably be noted that there was no chapter on chronic constipation." It might be added that there would be a number of other chapters missing.

There is an interesting chemical analogy between the mother earth and the bodies of the higher forms of animal life and no doubt the lower forms also. There is a similarity between the chemistry of the body and the soil. The same chemical and mineral substances necessary for fertility in the soil are also necessary for health and fertility in man and animals.

Of these substances the most important ones are the metals: calcium, magnesium, potassium, sodium, iron and manganese; and of the non-metallic are oxygen, hydrogen, nitrogen, phosphorus, chlorin, iodin and sulphur.

Virgin upland soils for the most part are slightly alkaline in reaction and the

first crops are usually luxuriant and little subject to disease. As repeated crops are taken off, they take with them considerable amounts of the bases, principally potash, lime, phosphorus and soda, and the chemical reaction changes and we have an acid soil or acidosis, and in consequence, spindling crops that are more subject to disease and parasites.

A deprivation of these substances in the body, results in the same thing, spindly growth, non-resistance to disease and parasites, rickets, scurvy, tuberculosis, cancer, diabetes, nephritis, anemias, ophthalmic diseases and neurosis. In most of the diseases mentioned there is a decrease in the alkaline reserve of the blood. Cancer is known to thrive best in acid tissues and decreased alkalinity of the blood is no doubt favorable to the development of cancer. It is quite likely that a decreased alkalinity favors the development of these diseases rather than that the decreased alkalinity is due to the disease. The soils are starved and we have acid soils and weakened growth and disease. In our modern preparation of foods these same substances, calcium, potash, phosphorus, soda, iron, iodin, etc., are removed, and we have diminished alkalinity and a lessened resistance to the diseases mentioned above. And how are we deprived of these substances? By throwing away the more soluble chemical substances in the waters in which our vegetables and meats are cooked and by the milling of grains, whereby the parts richest in lime, potash, phosphorus, soda, magnesia, etc., are contained, and by further destroying the important vitamins by cooking and aging in cans or by storage. The vitamins are necessary as the spark to set off the fuel ammunition and make it available to the body. We not only take out the important elements but by freezing, cooking, preserving and storing, we destroy or impair the vitamins and we are obliged to eat too much food in order to survive.

Pestilence and disease have always followed starvation. Most chronic diseases are diseases of malnutrition. Rickets can be classified as near rickets, dental rickets and plain rickets, and so with scurvy and pellagra and beriberi and ophthalmia. The half-starved Hindus are subject to ophthalmia and cataract. The people of the South who live largely on degerminated corn have pellagra, while their neighbors across the Mexican border, who grind their own corn as they need it, and who live on polished rice are subject to beriberi, and the people whose diet is deficient in vitamin A are undersized as the Japanese.

In summarizing, the following statements are based on observations covering fifteen years and are made with sincerity and thorough belief.

1. That certain primitive people live with little disease and that this is due to simple methods of living, and principally because they live on simple foods that have not been tampered with by modern civilized methods.

2. While no Utopian idea is entertained, it would seem that improvement could be attained in civilized communities by a closer scrutiny of the methods of the simpler races.

3. That modern methods weaken the resistance to many annoying and dangerous diseases.

4. That there is already great improvement in the knowledge of the importance of proper food but that the knowledge is not sufficiently impressed upon the people.

5. That the glitter of recent brilliant medical discoveries tends to obscure some of the simple basic things.

6. That the very striking results obtained by rest and baths and an intensive milk diet prove that simple untampered food, much of it raw, is extremely important in preventing disease and in restoring health.

Spear Grass, Needle Grass or Porcupine Grass

L. H. PAMMEL, Iowa State College, Ames, Iowa

DURING THE MONTH of September last year, the writer received an interesting communication from Mr. E. R. Harlan, Curator of the Historical Department of Iowa, who received from a Mr. L. C. Sutherland of Sioux Falls, South Dakota, a story of a trip from the Red River country to Kentucky for sheep. The story is of much interest to veterinarians. I take the liberty of using it in Veterinary Medicine. The story in full has appeared in the Annals of Iowa of the State Historical Department of Iowa. I am using only the part pertaining to the loss of sheep from spear grass or needle grass.

Red River Sheep Story

Mr. L. C. Sutherland makes the following comment regarding the account of the trip as submitted to him:

"During the first fifteen years of the life of the Red River Colony at Fort Gary, the settlers endured severe hardships. But in the year 1830 the spirit of speculation greatly raised their hopes.

"With the assistance of Sir George Simpson, Hudson's Bay governor, a number of projects were put forth for the development of the country. Among these was the introduction of sheep from Kentucky. A joint company was organized and the sum of twelve hundred pounds was raised by the colonists.

"Previous to this time Governor Simpson, while visiting Scotland made the acquaintance of Robert Campbell, the son of a sheep farmer of Perthshire. Mr. Campbell was then a young man, twenty-four years of age, well educated. He immediately won the confidence of the governor. An agreement was made and Mr. Campbell was sent to Red River for the purpose of taking charge of the sheep enterprise for the colonists and the company.

"Some time before the death of Mr. Campbell, years afterwards, this story was written by him, and through the kindness of his daughter, Mrs. John M. McDonald, of Winnipeg, I am able to present it in Mr. Campbell's own language."

Excerpts from "A Journey to Kentucky for Sheep"

In the meantime another scheme was in contemplation, and plans were being made for carrying it out, and so, on November 6, 1832, I was instructed to hold myself in readiness to join a party about to start for the United States, for the purpose of purchasing sheep, which the company was anxious to introduce into the settlement. The very limited, and I may add, very injudicious, preparations for our departure being completed on the afternoon of the 8th, we commenced our journey, crossing to the east (St. Boniface) side of the Red River at the Fort. The expedition was entrusted to the command of William Glen Rae, a clerk in the Hudson Bay Company's service. Associated with him was Mr. Bourke, a middle-aged retired Hudson Bay clerk, who was especially engaged for the trip, as were all the other members of the party except Mr. Rae and myself. We were ten in number all told.

June 3, 1833. We crossed the Illinois River at Fort Clark or Peoria. From this point we had no direct road to Rock Island, so a guide was hired who drove the wagon ahead.

June 8th. For the first time we saw that dreadful scourge, the spear grass, growing pretty thick along our route, and

noticed a few of the awns sticking in the wool of the sheep.

June 10th. Since the last date we had several bad streams to cross. The flies were extremely irritating. The plains were everywhere covered with spear grass, and this morning five sheep were found killed by rattlesnakes. We fell in with the Jackson road and camped at Rock River. The spear grass was now telling severely on our flock. Before this we had never seen or heard of this destructive grass. If we had known of its disastrous effects, we could have avoided it by making a detour or by waiting till the grass ripened and fell, and thus our flock and ourselves would have been spared much suffering and pain. The spears worked into the flesh of the sheep, causing putrefying sores, which were infested with maggots; then mortification set in and the result was the death of the victim. The flies were also a constant plague to the poor sheep which hardly got peace to snatch a mouthful.

June 13th. Camped opposite Rock Island Ferry and astonished the natives not a little with our large flock. These same people had seen us in December and had taken us for a lot of miserable Indians. After crossing the Mississippi, we were employed shearing the sheep and lambs and pulling the spears out of their flesh. This was sickening work, some of the sheep being one moving mass of maggots and matter.

June 25th. A great deal of rain had fallen and the ground was very heavy. Our sheep were dropping off and dying by twos and threes; some of them were one mass of suppuration, aggravated by heat, flies and maggots. We again resumed our heart-rending job of shearing them to the skin, picking out the prickly spears and doctoring the suffering animals as best we could. For sheer curiosity we examined the bodies of some of the dead sheep and counted the spears embedded in the carcasses. The number in some cases seemed incredible, amounting to several hundred, some of the spears being several inches deep in the flesh.

July 7th. From the last date we came on by short stages, traveling being still very bad owing to soft ground. From the effects of the spear grass ravages, our flock was now diminished to 670.

Thus terminated our long, harassing and dangerous trip, a trip which was most disappointing in its results. The most of our trouble and the whole of the sad diminution of our flock was brought about by the wild spear grass and our total ignorance of its existence. Had we commenced the trip with the knowledge and the experience, which, alas! we bought at so dear a price, we all felt certain that the enterprise would have been an entire success and that we would have brought in our flock all but intact. Shortly after our return, the sheep were removed to the farm, and I was put in charge for the winter.

"Spear Grass"

The fact that the common name "spear grass" is used for so many different grasses shows how one may be misled by common names of plants and how essential it is to indicate the scientific names. Let us take the common names given by Webster. The name is applied to any of numerous grasses having spear-shaped inflorescence; as (a) couch grass (Agropyron repens—quack grass); (b) bent grass (Agrostis alba); (c) meadow grass (Poa pratensis and other species—blue grasses); (d) the common reed grass (Phalaris arundinacea); (e) the slender foxtail (Alopecurus); (f) porcupine grass (Stipa spartea, S. avenacea); (g) an Australian beard grass (Andropogon contortus).

The International Encyclopedia gives spear grass as synonymous with blue grass, June grass, or meadow grass (Poa pratensis).

Only two common names are used in this country for this grass; namely, blue grass and June grass. The name "meadow grass" is a textbook name commonly applied to all of the members of the genus Poa. "Spear grass" (Stipa) is used only in the British Isles and by descendants from these people in Canada and other

English speaking members of the British Empire. You can trace the English ancestry in this article by the use of the name "spear grass" in this connection. The plant referred to in the journal is undoubtedly porcupine grass, needle grass, or sometimes known as spear grass. There are no porcupine or spear grasses native to the British Isles, because the species are arid or semi-arid plants. No doubt, however, some species were frequently cultivated in Great Britain.

The genus Stipa is especially common in prairie regions of the old and new world, some occurring in the tropics. The esparto grass of the Spanish is common in North Africa and known as Stipa tenacissima. This is now used for the manufacture of paper. Feather grass (Stipa peunata) is a native of eastern Europe and is used for dry bouqets. Several species of the genus Stipa are poisonous. Of these are the well known Stipa inebrians of Mongolia and our North American Rocky Mountains, Stipa vaseyi and possibly also S. viridula.

From the description of the injuriousness of spear grass given in the article, I am certain that it is one of the porcupine grasses. The eastern North American which occurs from New England to Texas is Stipa avenacea. The callus (lower part of the fruit) is sharp-pointed and might easily get into sheep. The distribution of this species overlaps the Mississippi Valley porcupine grass, commonly known in this section of the United States as needle grass, certainly a name that is quite as appropriate as porcupine grass. Both of these common names indicate the character of the fruit. Our needle grass is Stipa spartea. Since the callus is much stronger and longer and the fruit larger, I think the trouble to sheep referred to was caused by this species. A western species common in the Red River Valley in western Minnesota and the Dakotas to the Rocky Mountains is the Stipa comata. This occurs along the Missouri River, in a few places in Iowa and at Sioux Falls, South Dakota. In my Manual of Poisonous Plants, pages 356 and 357, I have this to say about the injuriousness of these plants:

"Dr. M. Stalker says the fruits of the porcupine grass are a frequent source of inconvenience and injury to living animals. In many of the northwestern counties of Iowa, this grass grows in the greatest profusion, and during the latter part of June, the season for maturing and consequent falling of these spines, they are the occasion of much annoyance and in some instances the death of domestic animals. Only such animals as are covered with wool or a thick growth of long hair are seriously inconvenienced. Sheep suffer most. The spines readily find lodgment in the wool, and after burrowing through it, frequently penetrate the skin and bury themselves in the flesh. A large number of these barbs thus entering the tissues of the body produce an amount of irritation that is sometimes followed by death. I have seen large numbers of these imbedded in the skin and muscular tissues of shepherd dogs that were covered with a thick growth of soft hair. These sagacious animals frequently exhibit the greatest dread at being sent into the grass during the season of danger."

Professor Bessey in his inquiries into the structure and nature of this plant received several responses, one of which, from Professor King, formerly of the University of Wisconsin, was as follows:

"In connection with the two notes relating to the fruit of the porcupine grass, it may not be without interest to say that while engaged in geological work in Dakota, north of the Northern Pacific railroad, we were much annoyed by the fruit of this grass. Indeed, I found the only way to walk with comfort through this grass (Stipa comata) was to roll my pants above my knees and my socks down over my shoes. I also observed on several occasions these seeds planted two inches deep in the soil with the awns protruding from the ground. It is plain that with the point of one of these fruits once entered below the soil, the swelling and shrinking, due to varying amounts of moisture,

would work the seeds directly into the ground."

The Stipa comata, or needle grass of the west, which is common throughout the Dakotas, Nebraska, Wyoming and Colorado, is common in prairie hay, and Professor Thomas A. Williams mentions that, though a forage plant, and not cut until the needles have fallen so that the stock may not be injured, the fruit of this plant often injures stock to a considerable extent. During last summer in Alberta, Canada, the writer suffered some inconvenience from the penetration of the fruit through the clothes.

Some years ago when I was at Winnipeg and Regina and other points on the plains of the Canadian Northwest, the awns of the Stipa comata penetrated the skin through our clothes and seriously inconvenienced us, causing festering where the awns were not removed at once. One can readily see that this plant is often very injurious. Similar injuries are caused by grasses related to Stipa like Aristida, etc.

Erysipeloid and Swine Erysipelas in Man*

JOSEPH V. KLAUDER, M. D., Philadelphia

SWINE erysipelas is an acute septicemic infectious disease of young hogs caused by a fine rod shaped bacterium—B. erysipelatis-suis. The disease occurs everywhere on the European continent and is widely spread in Germany. It causes considerable financial loss.

The disease is manifested in the three following forms: A mild form, urticaria (diamond skin disease), characterized by slight constitutional symptoms and the presence of sharply circumscribed, rounded quadrangular or rhomboidal spots on the skin, warm to the touch and dark red or violet; a severe form, erysipelas septicemia, characterized by constitutional symptoms of septicemia and the presence of a diffuse erythema, areas of which may become gangrenous; a chronic form, chronic erysipelas, endocarditis, occurring in animals that have recovered from the acute infection, particularly characterized by polyarthritis and symptoms referable to what is a distinctive pathologic finding, a vegetating type of endocarditis.

Since Hildebrand and Mayer first reported in 1899 the occurrence of swine erysipelas in man, an ever increasing number of cases has been notably reported in the German medical and veterinary literature.

Swine erysipelas in man has been most frequently observed through a prick of the needle when immunizing swine against the infection with the serum of swine erysipelas and a small quantity of virulent culture. In ninety-seven cases compiled by Ders from 1901 to 1912, sixty-eight patients were inoculated from culture in the aforementioned manner or from handling the culture among laboratory workers; thirty-two cases were traced to infected meat and were observed in butchers, farmers, meat inspectors, cooks and others handling such meat; in the remaining seven cases the source of the infection could not be traced.

In the majority of patients, the disease appears at a site of injury involving the fingers or hands. The incubation period in swine is three days; in man, however, it ranges from one to four days. The symptoms are those of erysipeloid, with the exception that they are much more severe; the swelling is much greater, so that the fingers frequently become immobilized; the itching, burning and pain are considerable, the latter often prevent-

* Excerpt from article in The Journal of the American Medical Association, Feb. 20, 1926.

ing sleep. Lymphangitis and glandular involvement are frequently present. The disease frequently extends above the wrists, involving the forearms and arms. As evidence of a blood infection, Düttmann records three cases in which the disease first appeared on one hand and subsequently appeared on the other hand and later on both feet. More recently Axhausen and Rahm described a characteristic arthritis of the finger joints as a complication of the disease as it is usually manifested. In some of Rahm's cases, the arthritis existed without skin change. Constitutional symptoms and fever are rarely observed. Suppuration is absent. The course of the disease is about four weeks.

The differential diagnosis from erysipeloid is, in some cases, difficult. The following considerations serve to make such diagnosis: the history of handling culture; recent contact with hogs or the flesh of hogs; the severity of the symptoms; the greater incidence of lymphangitis and glandular involvement; the greater likelihood of the disease extending above the wrist.

The organism is obtained by taking cultures (in bouillon) of an excised piece of the involved skin. It is interesting to note that Rahm failed to demonstrate the organism in the blood and serum from an incision into the involved skin but demonstrated it by taking cultures of a portion of the skin from the same patient.

In histologic sections Düttmann clearly demonstrated the organism in the corium, in the deep part of the pars reticularis. For this reason, in order to obtain a culture of the organism, he points out the necessity of deeply excising a portion of the skin from which cultures are to be taken. Düttmann records the histologic appearance of the disease, which is not especially characteristic and will therefore not be detailed.

The aforementioned described cases of swine erysipelas occurring in man have been compared to the mild form of the same disease in swine—diamond skin disease. Fatal cases of the acute septicemic form of the disease have been reported occurring in veterinarians accidentally infected with a culture of the organism. The patients presented the clinical picture of sepsis, with bluish red lesions on various parts of the body: in some, arthritic pains and evidence of endocarditis. Prausnitz's case is of interest. In a patient with the clinical picture of sepsis, blood culture disclosed the bacillus of swine erysipelas. The patient succumbed. The source of the infection was undetermined.

The chronic form of the disease as it is seen in swine is apparently very rare in man. Rahm enumerates it as one type of the disease in man, characterized by endocarditis and polyarthritis.

It is interesting to note that the bacillus of swine erysipelas has an affinity for the skin. An oral infection from eating infected meat of swine is apparently very rare, although many opportunities have been doubtless afforded for such infection. Rahm states that in children an oral infection with the bacillus of swine erysipelas has been observed which produces an obstinate intestinal disorder. Again, Lubowski found the organism in large numbers in the stool of an icteric boy who had a mild intestinal catarrh. The organism was pathogenic to mice. The injection of the serum of swine erysipelas protected mice against lethal doses of the organism. Its identity was thus proved.

A specific treatment of swine erysipelas in man consists in the employment of from 1 to 2 cc. of the serum of swine erysipelas per kilogram of body weight, injected intramuscularly. Following its use there is a rapid subsidence of the symptoms and disappearance of the lesions. A second injection is rarely necessary.

The Question of Identity of the Two Diseases

It is the consensus of the German observers that erysipeloid and swine erysipelas are identical diseases, that erysipeloid is only a mild form of swine erysipelas. The organisms identified with the two diseases are likewise regarded as identical, differing only as to virulence.

From the typical cases of erysipeloid of Rosenbach, Rahm, Schmidt and Düttmann demonstrated, by taking cultures of an excised portion of the involved skin, an organism indistinguishable from the bacillus of swine erysipelas. Acel took cultures of a portion of the skin from five patients presenting the clinical picture of erysipeloid, in which there was no history of recent contact with swine or the flesh of swine. The organism obtained was at first a gram-positive coccus but later appeared as a gram-positive rod (confirmation of Rosenbach's original findings), which was regarded as the bacillus of swine erysipelas. Agglutination tests with serum from all the patients, conducted separately with cultures of the bacillus of swine erysipelas, yielded positive results.

Swine Erysipelas in the United States

According to Dr. John S. Buckley, chief of the Pathologic Division of the Bureau of Animal Industry, United States Department of Agriculture, the existence of swine erysipelas in this country was first demonstrated in 1920, through investigations made in his department. Since that time a considerable number of cases have been found, both acute and chronic. He states that it is not definitely known at present (March, 1925) just what the extent of the disease is in the United States. It is thought, however, that swine erysipelas is not very widespread, confined more or less to sporadic outbreaks occurring in a limited nmber of animals in different sections.

There are no recorded instances of swine erysipelas in man occurring in this country. However, in view of the existence of the disease, in both the acute and the chronic form, among swine in this country, it is logical to expect its appearance in man.

Organism of Swine Erysipelas, of Erysipeloid and of Mouse Sepsis

Clinically, infection with the organism of swine erysipelas and of erysipeloid is characterized by progressive inflammation with peculiar reddening. The clinical picture differs only as to severity of the symptoms. Human infection with the bacillus of mouse sepsis is unknown. In bacteriologic studies, and in their pathogenic properties, the three organisms strikingly resemble one another. Indeed, much controversy has been waged among German workers as to whether the three organisms are not identical, differing only as to virulence.

Prettner regards mouse sepsis bacillus as an attenuated form of swine erysipelas bacillus, the passage through mice accounting for its decreased virulence in swine. In this regard it is interesting to recall that Pasteur observed that the bacillus of swine erysipelas, when inoculated into rabbits, became less virulent to swine. Indeed, this led to the Pasteur method of immunizing swine against swine erysipelas.

According to Libbertz and Ruppel, erysipeloid cultures behave serologically just like swine erysipelas bacilli; that is, the agglutination titer is identical, and swine erysipelas serum immunizes against and affects therapeutically both infections.

Lorenz regards the two organisms as different from the cultural differences which he observed. Preisz at first took a similar view founded on five morphologic differences that he observed, but later concluded that the organisms are identical, despite morphologic and cultural differences. In Jensen's opinion, there are no basic differences between the two organisms.

In Rosenbach's study, the organisms of swine erysipelas, of mouse sepsis and of erysipeloid exhibited serologic and toxic similarity. He observed cultural and morphologic differences, which for lack of space will not be detailed. The growth of the three organisms, as observed by Rosenbach, was composed of a network of filaments, with chain forms; regular branching and thickening of the fibers, with formation of granules and clear spots, were also observed.

From these morphologic differences

Rosenbach concludes that the three organisms are distinct. In view of the aforementioned characteristics, he groups them as the erysipelas filaments, or Erysipelotrichea; viz., Erysipelothrix porci, Erysipelothrix erysipeloids and Erysipeiothrix murisepticus.

Rickmann, from the examination of a large number of cultures of the bacillus of swine erysipelas obtained from swine dying of the disease, states that the cultural and morphologic differences enumerated by Rosenbach are not maintained when a large number of cultures are studied.

Rickmann noted that swine erysipelas serum has the same agglutination titer against the organism of the three diseases. He believes that the three organisms are identical, but modified in virulence and somewhat in morphology through prolonged passage, respectively, in man, swine and mouse. Concerning a laboratory differentiation of the three organisms, Rickmann does not believe such differentiation possible.

Cooperation*

CHAS. H. REID, Los Angeles, Cal.

THE SINCERE desire of the veterinarian of today is to be a factor in raising the standards of veterinary medicine in his community, so that the laity will appreciate more and more the value of veterinary service.

We cannot reach the highest degree of efficiency without complete unity, and this unity cannot be obtained unless we have some means of bringing the members of the profession together through association where we can get both scientific instruction and social entertainment.

The question arises: Do we command the respect and confidence of the people of our community to the extent that we have a right to expect? Are we relying for this confidence and respect on the brilliance of a few men rather than on team work and cooperation of the profession as a whole?

The chief obstacles to cooperation are:

(1) Misunderstandings, usually senseless and without foundation, easily adjusted with a little frankness and friendly spirit.

(2) Lack of personal contact.

Cooperation is difficult to achieve among strangers. How often have we formed a false impression of a man's ability and later, after association with him, come to respect his attainments? This lack of personal contact can be overcome only by a better attendance at our veterinary meetings, where by social intercourse we can get a better estimate of and a more intimate relationship with our fellow practitioners, affording us an opportunity of recognizing the work of others and having the benefit of friendly criticism.

Someone has said, "There is no greater sin than that of holding an opinion as true without proper evidence when proper evidence is available." Nowhere does this more aptly apply than in our own profession. We all know how hazardous it is to form a judgment on assumption and without complete investigation.

Veterinary medicine is not an exact science and is therefore not uniformly successful, so we must learn to guard against the mistake of carelessness before the public. Is it not wise in cases that present problems along special lines to cooperate with men who have made special studies along those lines, and will not this procedure increase our esteem in the eyes of the client rather than be taken as a sign of weakness?

* Presented at the Southern California Veterinary Association meeting, April 19, 1926.

We are all working for the same goal, and many of us, either through force of circumstances or choice, have attained more knowledge and experience in certain lines than we have in others. If we recognize this fact and help each other, can we not get better results than would be obtained in any other way?

We are constantly decrying the quacks and the work they are doing because the public seems to accept them in preference to ourselves. But I firmly believe that with a unity of purpose and constant cooperation among ourselves, many of our ills would be cured and the general public would look with greater favor on our profession.

Let us subjugate our personal egos, forget our jealousies, and stand shoulder to shoulder for everything that will raise our standard of efficiency and increase the confidence of the public in us and their respect for us, so that we may become a power in the community of which we may all be proud.

Neoplasms in Wild Mammals and Birds

Philadelphia Zoological Garden-Laboratory of Comparative Pathology Observations on Tumors Encountered in 8,000 Autopsies

Presented at A. M. A. Meeting, Dallas, Texas, April 19-23, 1926

NEOPLASMS occur in all animals (about 2 per cent in the 8,000 mammals and birds examined at this laboratory). Frequency in the wild state is not known, but reports of travelers indicate their existence. All zoological orders suffer with tumors but some varieties more than others. Man's nearest relatives in the order Primates, that is, apes and monkeys, show very few tumors.

Rodents, marsupials, carnivores and parrots have more tumors than do other varieties of mammals and birds. The tumors that grow in these animals are closely comparable to tumors of man. Wild animals have naturally a great reserve and seldom give evidence of tumor growth, except of course where it is external. Observations can be made only upon captive animals. There is no evidence that captivity produces tumors. The longer the duration of captivity, the greater the period of observation, the more tumors will be found. Inbreeding possibly increases the incidence of tumors. There are arguments for and against the infection theory but the greater amount of evidence is against it.

In lower animals there are more tumors of internal organs and not so many of the breast, lips, skin, rectum and external genitalia as seen in man. Very few tumors of lower animals come from derivatives of the ectoderm; mesodermic and entodermic tumors are about equally represented.

Mammalian Tumors. Higher incidence than in birds. More found in wild-bred than in park-bred specimens. Liver, uterus, thyroid and mammary gland most often affected. Surface cancer, as of lip is rare. All tumors more common in males than in females. Metastases more common than in birds. The thyroid enlargements are prone to neoplastic change.

Bird Tumors. Not so numerous as in mammals. Most common ones are in the renal-adrenal-sex gland area. Metastases are rare. Parrots and shore birds more often affected than other varieties.

Malignant Epithelial Tumors. These represent about one-fourth of the tumors of this collection. They usually affect the organs of the trunk. Most common in wild-bred males. This type is usually

soft and adenomatoid, scirrhous being rare.

Sarcomata. These represent about one-sixth of the tumors of this collection, and are most often found in sex glands, muscle and lymphatic tissue. Lymphosarcomata have appeared as local and as general tumors.

Special Tumors. Endothelioma (mesothelioma) is rare, but a beautiful example was on exhibition.

Hypernephroma has been seen several times. The case of a bear was especially interesting because the tumor caused hematuria, and the presence of a growth was suspected before death.

Fibromyomata of the uterus have been seen several times. Four examples were shown, illustrating features well known for human beings. The pedunculated form in an armadillo and the calcification of some of the masses in an elephant were especially notable.

Interesting Groups. Carcinoma of the stomach wall, in the forms so well known for man, has not occurred.

Multiple adenomata of hepatic and biliary cells are occasionally encountered. They are usually of the regenerative type.

Pulmonary cancers of the infiltrating ulcerative variety were shown in a mouse and opossum. Scirrhous cancer has not been seen.

Tumors of the kidney-adrenal-sex gland group are especially common in parrakeets. They may be sarcoma, adenoma, carcinoma or hypernephroma. The reason for this tendency is not known.

"COOK PORK WELL," U. S. EXPERTS ADVISE

Raw or improperly cooked pork and pork products may cause the serious and often fatal disease, trichinosis. This warning is issued by specialists of the Bureau of Animal Industry, United States Department of Agriculture, especially to persons who are in the habit of eating raw or insufficiently cooked pork products, including sausage containing raw or dried pork meat and intended to be eaten uncooked.

Recent reports received from several sources by the department indicate that a number of cases of illness and deaths have resulted from trichinosis. This disease, because of the similarity of the symptoms, is often mistaken for typhoid fever. Trichinosis is painful as well as dangerous, and often affects all members of a family who have eaten raw, poorly cured, or insufficiently cooked pork. The ailment is caused by very minute parasites known as trichinae, but a temperature of 140° F. or higher renders the pork harmless.

Following are simple rules of food hygiene indorsed by Federal specialists: Cook pork well. A practical rule is to cook pork until the meat has lost its red color throughout all portions, or at least until the fluids of the meat have become more or less jellied. Federally inspected pork products of a kind prepared customarily to be eaten without cooking are safe since the inspectors require that all pork muscle tissue entering into such inspected products be subjected to a temperature sufficient to destroy all live trichinae.

Sleep, according to recent investigation, is a form of intoxication due to accumulation of toxic substances in the blood. It has also been demonstrated that the blood is detoxicated by sleeping. The length of time necessary for an individual to sleep depends upon the degree of intoxication and the capacity of the organs in elimination. Some scientist will no doubt devise some means of preparing an efficient antitoxin and thus eliminate the necessity of sleeping.

Botryomycosis of the Udder of a Mare Mule

G. W. BROWNING, V. S., Mobile, Ala.

On August 22, 1925, I received a letter from the owner of a saw mill some eighty miles distant, saying he had a mare mule that had a cauliflower growth on her udder and requested that I set a date to come and see what I could do for it. I named August 25th as the date to give the client ample time to get my letter so he could meet me at the depot and take me out to the logging camp where the mule was.

On arrival at the mill, I was given the following history. Some twenty months before while working in the timber, this mule got snagged in the udder with a pine stick of the kind they call fat pine in this country. They had pulled the stick out, and this cauliflower growth soon began to appear. It had been getting gradually worse for over a year and a half. The animal was a seven-year-old gray, female mule in good condition except for this growth on her udder; in fact, the mule was fat.

When I got there the mule was out in the timber and I had to wait about an hour for her to come to the mill. When she arrived she was in a four-mule team, she being the leading mule, or what they call the saddle mule. I made the best examination that I could with the mule in the standing position without any restraint and my diagnosis was that the condition was either botryomycosis or melanosis. The animal was a gray mule and of about the right age to develop the latter condition. However, the history of a traumatism by the pine snag caused me to be more certain that it was botryomycosis, which it later proved to be.

The pine stick had entered the base of the left teat and had caused a warty growth about the size of a pint cup, but the right side of the udder was fully three times as large as the left side with no abrasions and felt as hard as a rock. Of course, my prognosis was far from being favorable, and I informed the owner to that effect, telling him the only hope was to try an operation, to which he consented.

The mule was taken out of the harness and a set of Knowles' casting hobbles placed on her. She was cast in the dorsal position, and as there was plenty of help around the saw mill, we had no trouble in keeping her on her back. A local anesthetic was then injected over a considerable area all around the udder. The anesthetic used in this case consisted of one part oil of cloves and three parts echinacea (Lloyd's). Of this mixture I filled my five cc. hypodermic syringe six times and made injections something like two inches apart pretty well all over the udder. The whole surface was washed with acetone and my instruments placed in a solution of lysol.

I proceeded to remove the growth, removing the left teat and part of the udder on the left side. In all the parts removed weighed one and three-fourths pounds, but to my surprise there was very little pus. I was not satisfied and was sure there must be deep-seated pus on the right side where it was so large. The scalpel was run to the bottom of the cavity from where the growth had been removed and the instrument turned abruptly to the right, cutting a slit about two inches, from which gushed out about a half gallon of pus. With dressing forceps holding a wad of absorbent cotton dipped in pure carbolic acid, the cavity was thoroughly swabbed, after which the animal was let on its feet. I felt the patient had a chance to get well as when she was on her feet the channel was almost in a perpendicular position.

I gave instructions to let the patient rest at least five weeks, prescribed a treatment to be used once a day, and took the train for Mobile.

I did not hear from the case again until the first of October, when I received a letter from the owner, saying the mule was swollen as badly as it was before the operation, and he wanted to know if there was anything else that I could do. I informed him that the only thing that could do any good would be a second operation, that is, to cut a big piece out of the right side of the udder where it was so large and so hard, and if he said so I would come up and take it out. In the same letter he said something about riding the mule down to Mobile to my hospital and let me operate on her there. I told him it was too far to ride the animal in that condition; besides the operation and hospital fees for so long a time as she would have to stay there would amount to the value of the mule. Further, I advised him that if he could not afford to have me come up there and operate, he had better trade the mule off to someone that could let her have a long rest after she was operated on.

No more was heard of the case until October 29th, when about 5 p. m. the owner's hired man came riding the mule up to my hospital, having taken two days and part of one night riding the eighty miles. He said his employer wanted me to operate on the animal and keep her until she was able to go to work. He also stated that instead of letting her rest five weeks as I had instructed after the operation, she had been allowed to rest only three days. He said the swelling did go down considerably after the operation on August 25th. I told him to tell the owner that I would operate on the right side and remove the rest of the udder, but I had serious doubts about the animal standing this second operation, as if she didn't bleed to death, she might die later from the shock. I informed him I would have to let the patient have several days' rest before I operated as the long ride had increased the swelling until it extended nearly to her forelegs. On examination the operation on the left side seemed to have been a success, that part being practically all right, but the right side was a sight. It seemed as large as a two-gallon water bucket; very hard and knotty. A physic ball was administered and the patient put on a calcium treatment as I knew there would be plenty of hemorrhage during this operation, although the animal was fat and weighed 1400 pounds. As I was anxious to see the outcome, the mule was allowed to rest only four days, the second operation being undertaken on November 2nd.

The operation of removing the right side of the udder was practically the same as the first one, the same hobbles being used, also the same local anesthetic. However, the operation on the left side had not required the removal of any skin along with the growth, which was of a warty nature and not so large.

The technic of the operation on November 2nd was as follows: The animal was cast and secured as described in the operation of August 25th. I proceeded to dissect out the growth by removing a diamond-shaped piece of skin over the center of the enlargement, ten inches long, running from backwards toward the front, and four inches wide in its middle portion. The cicatrices of the previous operation were not disturbed, except to let the inner border of the right cavity come right up to the scar of the first operation, which insured complete removal of the udder.

It was a bloody operation, to say the least, but by the diligent use of artery forceps, the hemorrhage was controlled until the tumor was lifted out, this part weighing nine and three-fourths pounds. The wound was thoroughly cauterized with pure phenol as in the first operation and the animal released from the hobbles and allowed to get on her feet. She was placed in a box stall, 16 feet wide and 20 feet long, well bedded down with clean pine shavings, and left undisturbed for the night.

On the morning of November 3rd, examination revealed the mule with a temperature of 104° F., pulse 60, respiration 40, with no appetite. She did not eat anything that day and was very badly swollen about the region of the operation, the swelling running forward half way to the forelegs. The wound was dripping like a freshly tapped sugar tree in February.

I began to give a fever mixture every three hours during the day and until nine o'clock that night, the formula being as follows:

℞

Specific tinct. veratrum,	℥ vi
Specific tinct. echinacea,	℥ iss
Sodium hyposulphite,	℥ ii
Aqua q. s.,	℥ xii

M. Sig. one ounce every three hours during the day.

The wound was dressed once a day with iodized echafolta by applying it to all parts of the wound by soaking absorbent cotton in the medicine and applying it with the dressing forceps. The tail was kept washed once a day with soap and water to which lysol was added.

On November 4th the temperature was 103.4° F., pulse 50 but greatly oppressed, respiration 40. The swelling had extended forward to the front legs, and the wound was dripping as badly as on the previous day. However, the animal's appetite was fairly good, and from this time on she never failed to eat.

On November 5th the temperature was 102° F., pulse 42 and much stronger, respiration 50. By this time the patient had turned as yellow as a pumpkin all over, the wound was dripping as badly as ever, and the swelling had extended forward and up the neck half way from the sternum to the throat, in which condition it remained for over three weeks.

I discontinued the fever medicine and began to give a tonic and mineral mixture with the feed twice a day. For roughage alfalfa hay was supplied in liberal quantities all the way through. The iodized echafolta was discontinued as exuberant granulations began to appear, and I saw a stronger preparation would have to be used or the growth would soon be as bad or as large as it was at first. Being determined not to let such a condition occur, I began to dress the wound once a day with the following ointment:

℞

Zinc chlorid	℥ iv
Acid salicylic	℥ i
Unguentum thuja	℥ xvi

M. Fiat ointment.

Sig. Apply once a day.

The tonic and mineral mixture used in the feed night and morning was as follows:

℞

Calcium phosphate precipitate	℥ viii
Sodium chlorid	℥ vi
Potassium iodid	℥ i
Powdered balmony	℥ x
Powdered nux vomica	℥ iv

M. Sig. Tablespoonful two times a day in the feed.

At the end of the third week, the patient lay down, and the general swelling around the seat of the operation began to subside. The last mentioned ointment was discontinued and straight thuja ointment substituted. Also a solution of Pinus Canadensis (Lloyd) was used on the inside of the thighs once a day for the chafing caused by the heat and swelling of the parts.

I plodded along with this same treatment for about four weeks with but very little change, and while the general swelling of the parts had become reduced considerably and the wound was healing satisfactorily, it remained hard and knotty on the right side, which worried me no little, as it seemed the growth was bound to recur. For this swelling I began to smear the surface all over with libradol once a day. From the start it began to ooze out a yellow looking fluid where the libradol was applied, and in a few days it came to a head in two or three places in front of the udder, which I lanced and let out considerable pus. The thuja ointment was still kept up on the inside of the wound. This constituted the treatment up to the time the animal became my mule.

The owner had never inquired about the mule until December 5th, when I received a letter from him asking how she was getting along and when she would be ready to take out of the hospital. I informed him that if she was turned out into a paddock and not put to work for three or four weeks, she could be taken out then. He answered by saying that he was moving the saw mill much nearer Mobile, only 35 miles from the city, and he would send for the mule on December 12th. He asked me to mail him a statement of his account and he would send a check by his man who was to come for the mule. I immediately mailed him the bill, which was $102.00. However, instead of sending for the animal on December 12th, he mailed me a bill of sale for her for $102.00. I went to see my attorney about mailing the bill of sale back and entering suit for my account, but I did not get much encouragement as to the prospects of winning my suit. Therefore, I decided to accept the remuneration the owner had given, pocket my loss and try to profit by past experience. However, it was a bitter pill for me to swallow.

Things rocked along until the twelfth week. Some days I thought the mule would get all right, and a few days later I would change my mind and come to the conclusion she never would get well, and to think of the cash money I had put out for feed and medicine.

By this time the wound had healed until it was scarcely the size of one's hand. When I took the patient out for a morning's walk, she would jump and kick up her heels whenever an automobile or street car approached, which made me feel better. But here another complication set in. In the small unhealed space, a warty growth began to drop down below the skin and prevented healing. In the center of this growth was a channel or fistulous duct extending up about four inches and as wide as one's two fingers. I then procured four ounces of 40 per cent formaldehyd solution, applied it to wads of absorbent cotton and tamped this cavity full. I also took a small paint brush and went over the external surface with the solution, being very careful not to get it on the sound skin. In seven days I pulled out a cone-shaped piece, four and a half inches long and three inches in diameter at its base, leaving a healthy granulating surface, which was again dressed once a day with thuja ointment.

The mule began to improve wonderfully from this time on, and seeing she needed some light work, on February 16th I let a man that runs a truck farm have her to work for her feed, which she is doing as well, he says, as any mule on the place. There are no signs of any more new growths since the formaldehyd treatment, and while the animal is not entirely well, she is so nearly so that I predict it will be only a matter of a very short time until she will be worth $300, the price my client paid for her two years ago. Of course, I don't expect to get that price for her.

This was my first experience of amputating the udder of a mule, and unless I change my mind from what it is at the present time, it will be my last attempt at this kind of an operation, as it involves a too long drawn out process before the animal can be put to work, and the patient has to be rather valuable to be worth the undertaking. However, in a case where the tumor would not be so large as this one and not of so long standing, I might be induced to try it again, that is, if I were pretty sure I would get my pay for it.

The reason I did not use a general anesthetic was that away out in the "sticks" like this was, no expert was at hand to administer it properly, and I had been using this oil of cloves and echinacea on a case of fistula in a horse without casting a short time before, and the animal scarcely moved. That is why I decided to use only a local anesthetic in this case, and it worked well as the mule made only two or three very slight struggles, showing there was very little pain during the operation.

The reason I used the calcium before the operation was to prevent hemorrhage

by getting plenty of calcium into the circulation, thereby increasing the fibrin constituents of the blood and hastening coagulation. It has proved of value in reducing hemorrhage, especially in cases of hemophilia or so-called bleeders. The form in which it was used in this case was calcium lactate in five-grain tablets, the dose being 120 grains three times a day. I placed 24 of these tablets in a one-ounce capsule and administered with the balling gun.

The reason I gave the combination mineral and tonic mixture was from the fact that such a flow of serum, lymph, etc., from the wound was drawing on the mineral reserve of the animal's system, so that it had to be replaced if she was to pull through the ordeal.

In treating the wound after the operation, I was guided largely by my past experience in treating such wounds. I have found that for a fresh wound it is hard to get anything that will beat iodized echafolta, and for exuberant granulations thuja has its usefulness. For an outlawed case like this came to be, formalin is the remedy. However, I would warn the practitioner not to be too quick to use this preparation as one has to be very careful not to let it get to any more sound tissue than one can possibly help as it kills everything before it. This is one reason I used it here as I thought it would destroy any live Botryomyces that might still be lurking in the parts. The iodid of potassium used in the tonic mixture was for the same purpose, i. e., destroying any fungi that might be circulating in the blood.

As an external application for drawing and reducing a swollen part, libradol certainly does good work, and I have never had any use for any other poultice since I started to use it, which was a number of years ago.

The alfalfa hay was fed for roughage to keep the animal's bowels from getting constipated, and it also contains a good amount of calcium and digestible protein. The grain feed consisted mostly of oats with an occasional bran mash. The mule lost about 150 to 200 pounds in weight up to about the tenth week, but she is gaining in flesh right along now, and I hope soon to see her back to her former weight.

The textbooks we have do not give much on botryomycosis in the horse or mule, and about all I could get out of any works on the horse was in Dollar's "Regional Surgery," page 456. This compelled me to go almost entirely on my own resources in treating this case, and I should like to hear from any one that has had experience in treating this condition, especially removing the udder.

DOES SPAYING AFFECT SENSE OF SMELL OF BITCHES?

Please inform me if the operation of spaying in bitches of the sporting breeds renders them unfit for training as hunting dogs? Some trainers claim bitches lose their sense of smell after this operation; others say they work truer by being operated on.—R. B.

Reply by J. G. Horning: We average about six spaying jobs a week in our hospital, so have a fairly good opportunity to observe the effect of this operation on a bitch because of the animal being brought back for other treatment and observed over a period of years.

As far as I ever noticed, the spayed bitch made a better animal. I know of no cases where the sense of smell was lost, but do know there were never any interruptions from whelping, heat periods and other conditions that one finds in the normal bitch. Of course, spayed bitches have a tendency to get fat faster than others if overfed, but with regulation of the diet, there is no reason for worry on this score. In all cases observed, a complete laparo-metro-oophorectomy was performed as described in our article in the February, 1925, issue of Veterinary Medicine.

MONTANA STATE AGRICULTURAL COLLEGE LIBRARY MAY 28 1926

Losses of Pigs Due to Goiter

A. T. KINSLEY, Kansas City, Mo.

LOSS OF PIGS due to goiter is rather common in the northern and northwestern states and some parts of Canada. This condition has also been observed in certain areas in other states. According to the available reports, pig losses due to goiter have been quite large in Montana, Minnesota and Wisconsin, and probably also in the Dakotas. It was estimated that the loss in Montana alone exceeded 100,000 pigs annually. Goiter is much more common in some localities than in others, probably because of variations in the composition of the soil and the foodstuff. This condition may occur either when the sows are kept in small pens or when running at large. In some instances one breeder or several breeders in a community have no losses from this malady, while other breeders that have farms adjacent have extensive losses. Another peculiarity of this disease is that as a rule only a portion of the sows on a farm will produce hairless pigs although on an occasional farm this condition has affected 95% of the entire pig crop. This condition is much more common in the spring farrow than in the fall. Instances have been reported in which 95% of the spring farrow was hairless and the same sows produced 100% normal pigs in the fall farrow.

From evidence available it seems probable that some cases of goiter in pigs have been erroneously called abortion. This condition goiter is usually designated "hairlessness in pigs" by laymen because the affected pigs although mature are usually devoid of hair.

Cause

The specific cause of goiter is a deficiency of iodin salts. This deficiency of iodin is usually in the food; however, the primary deficiency may be in the water or more likely in the soil. Foodstuff grown upon some iodin deficient soils have a deficiency in iodin. In one instance sows that produced hairless pigs in the spring were moved about one mile and farrowed normal pigs in the fall and the following spring, and when moved back to the original lot for fall farrowing they produced hairless pigs, which would seem to indicate the iodin deficiency was in the soil.

Foods may contain the usual quantity of iodin but it may not be in a form that can be utilized. Goiter may occur in pigs regardless of the character of the food for the sows—grain, hay, roots, etc. However, goiter is much more prevalent in the fall farrow than in the spring farrow which would seem to indicate that green growing vegetation contains sufficient available iodin for normal development.

Symptoms and Lesions

Goiter in pigs is characterized by hairlessness and an enlarged thickened neck. Goiterous pigs are usually fully mature when farrowed and may or may not be dead. Live goiterous pigs usually die soon after they are farrowed. Pigs affected with goiter have a characteristic appearance due to hairlessness, a large head and neck, and the skin from the shoulders forward is thick and wrinkled. The hoofs of such pigs are usually thin and much less durable than in normal pigs. The thyroid glands of goiterous pigs are much enlarged but are deficient in iodin according to a report of the Montana experiment station. The degree of hairlessness or extent of goiter in a pig varies in a direct ratio with the iodin content of the thyroid gland.

Treatment

Losses of pigs from goiter can be diminished by proper feeding providing the feed has been produced on a soil that is not deficient in iodin. The soil on some

farms in the drainage basin of the Yellowstone, the lower Missouri, and Musselshell rivers is so deficient in iodin that goiter occurs regardless of ration. On the other hand breeders in most locations have reduced the losses of pigs from goiter to a minimum by feeding the sows on a ration of three-fourths grain and one-fourth alfalfa hay. A properly balanced ration of concentrates for sows will not prevent the occurrence of goiterous pigs. In some way it appears as though bulk in a ration for breeding sows, such as alfalfa hay, is essential in preventing goiter in pigs.

In addition to providing a proper ration it is sometimes advisable to administer iodin in the feed. The form of iodin usually administered is potassium iodid. The amount of potassium iodid required will vary according to the iodin deficiency in the feed; however, one grain daily or five grains each week per sow administered in the feed during the period of pregnancy will practically eliminate goiter in pigs. It is possible that farm animals in general, and pigs in particular, do not obtain sufficient iodin in their feed even though there may be no evidence of goiter. According to a recent report of experiments conducted at Ames, Iowa, the supplemented feeding of pigs with potassium iodid increased the daily gain in weight approximately ten per cent and decreased the amount of feed necessary for one hundred pounds gain by ten per cent. The iodin fed pigs made larger growth than check pigs. Thus the iodin apparently increased the growth and development and diminished the length of the feeding period and the amount of feed required.

Thus goiter in pigs is of dietary origin and can be prevented by providing the proper ration and by the administration of potassium iodid to the sow during the gestation period.

VARIATIONS OF CANINE DISTEMPER

A few months ago I was called to a kennel in which distemper had broken out. The animal affected was a Fox Terrier bitch, three years old, and she was in contact with her four puppies—four months old—a dog of two years and a pregnant bitch of about three years.

Isolation was carried out. The pregnant bitch never became affected, but in a week all the others had developed symptoms.

In the bitch, the symptoms ran a typical course. Discharge from nose and eyes commenced early; cough, capricious appetite, and loss of condition were present, but in eight days the crisis in the bronchopneumonia was reached, and thereafter the patient made an uneventful and fairly rapid recovery.

The dog never lost condition—had a hoarse croaking cough, was off food for one day, and had a temperature of 103° for four days. There was no discharge from either eyes or nose. He recovered within a week.

The cases of the puppies differed entirely from those of the adults. All had a temperature of 104° or 105°, and swollen eyelids, but practically no discharge from the eyes. There was no nasal discharge. All had coughs and rapidly lost condition. Appetites were capricious and in a week all four were being forcibly fed. There was no vomition, but in all cases a mild diarrhea was present. There was no visible evidence of blood. In three weeks two had died—one in convulsions—and a third was destroyed in extremis.

The case of the fourth puppy was unusual. After a fortnight's forcible feeding, his appetite returned, and his eyes became catarrhal. The cough persisted and the temperature remained at 104° to 105°. He became somewhat lively, and remained in this condition until the end of the sixth week, when the eyes became worse, and a keratitis developed which yielded to treatment. After eight

weeks, a nasal discharge commenced. This was profuse and semi-solid in consistence. It lasted about a week. The patient became livelier and looked normal. He was growing rapidly and was now allowed to run about for an hour or so daily, having exhausted his nurse's patience. His temperature, despite his apparent health, was never below 103.5. The appetite was good, and he received, in addition to his food, cod liver oil and lime water.

After fourteen weeks I called to see him. He had difficulty in walking and the muscles of his forearm were obviously wasting. There was an occasional twitching of the lower lip. This condition became quickly aggravated, in spite of treatment. In a week he was unable to stand on his forelegs, and in a fortnight he had lost power behind, and tried to progress by means of his chin. Cerebral excitement became manifest, and I destroyed him after an illness lasting just over sixteen weeks.

The nursing throughout had been all one could wish for. All dogs were fed every two hours during the critical stages, and neither time nor expense was spared in the owner's endeavor to save the puppies.—J. K. Bateman in The Veterinary Record.

SUNLIGHT ASSISTS IN ASSIMILATION OF MINERAL FEED

I noticed the query by M. A. L. in the May issue of Veterinary Medicine and Dr. Kinsley's reply, regarding dietary deficiency causing loss of pigs. Having encountered a number of cases that were identical, I feel that my experience may be of some interest.

I wish to refer to two cases in particular, in one of which mineral feeds were given regularly and in the other no minerals were fed. Both of the owners had good hog houses, and the deaths of pigs occurred just as described by M. A. L. and with the same postmortem lesions.

In addition to supplying minerals, I had both of these hog raisers get the sows and pigs out on clean ground and exposed to the sunlight. There were no more losses. It seems that the sunlight assists in the assimilation of minerals.

E. E. Clore, D. V. M.
Greenwood, Ind.

CHOREA IN A PUPPY

I have a fine Police puppy, seven months old, that has developed a case of chorea, jerking and twitching in the right front shoulder and leg. The condition is shifting or developing in the other front leg somewhat. This started two months ago after vaccination with distemper serum. The puppy otherwise is apparently healthy, eats well and is growing. The ear on the affected side is lopped over while the other is in proper position. I want to know the very best method to combat this development in the puppy. I am feeding it a tablespoon of phosphated cod liver oil three times a day and giving a hypodermic injection of 2 cc. of sodium cacodylate every five days subcutaneously. Can this be given oftener? Please suggest the best treatment.—D. F. P.

Reply: It would be difficult to improve on the treatment you have outlined for the puppy affected with chorea, which, of course, is a sequel to distemper and not to the vaccination. Since you have been giving sodium cacodylate without benefit, perhaps it would be well to discontinue that and instead give iron, quinin and strychnin arsenate—about 1/60th grain of strychnin arsenate three times daily after feeding.

The prognosis in chorea is largely a matter of guess. A few moderately severe cases improve, but seldom entirely recover. Mild cases frequently recover. Good feeding, exercise and sunshine are beneficial. The very mildest cases sometimes progress to a fatal termination, and this is the ordinary outcome of the severe cases and of the moderately severe cases. On autopsy these cases may show profound changes in the cord, indicating that a fatal termination was the only possible outcome, and yet in the beginning they may not have looked different from cases

that occasionally recover. The fact that the case you describe has already existed two months and is still extending to unaffected muscles would incline the writer to give an unfavorable prognosis.

CHARITY ANIMAL HOSPITALS

Dr. Scofield of Florida, in 1923, after inspecting a number of veterinary hospitals on his trip north, made the following statement: "I have seen in the Angel Memorial Hospital in Boston patients from Massachusetts, Connecticut, New York, Michigan, Ohio, Pennsylvania, Kentucky and other states. I am sure that the states of Ohio and Pennsylvania have as good veterinarians as the Angel Memorial Hospital now has or ever will have."

What effect will these institutions have on the veterinary profession in the future?

A number of veterinarians in New York City, including myself, have stood firmly by the various charity animal organizations, believing that they were doing a great work for the animals of the poor. Today, however, these institutions have grown immensely rich and powerful, have established large veterinary hospitals, and are strong competitors of all the practitioners in and for many miles around New York City.

Their methods of conducting their business do in no way conform with professional ethics. They are maintaining publicity agents and advertising in all conceivable sorts of ways. The following are a few examples that have appeared in the public press:

"Mrs. ——— has made reservations in the maternity ward of Hospital ——— by radio from the middle of the Atlantic Ocean."

Another article, speaking of the violet ray treatment for distemper, stated that there were only three places in the United States where such treatments were used, one in St. Louis, one in Boston, and one in the Women's League Hospital in New York. This was published in a number of newspapers in the city, including pictures in the Sunday colored sections. Then followed the statement that the Women's League in their well equipped hospital, with the violet ray treatment, are now curing 50 per cent of their cases of distemper, while all other veterinarians can cure only 30 per cent. It is needless to say that the public immediately called up the various private institutions inquiring about this wonderful treatment.

The organization also report that their business in 1925 about doubled over 1924; that in their clinic and hospital over 15,855 cases were treated, of which 4,554 got free treatment. They show a fee of $27,801.24 from cages and clinic charges.

The New York County Veterinary Medical Association appointed a committee to investigate the workings of these so-called charity animal organizations. We find that this movement is not only in Boston and New York but nation wide. There are now clinics conducted by veterinarians in different cities in New York state, such as Poughkeepsie, Albany, Buffalo, etc. I am also informed that a large institution of this kind is being built in Cleveland, Ohio. It is evident that veterinarians are called upon to assist in holding these clinics, giving free treatment for the poor just long enough for the institutions to establish themselves when they become the practitioners' most dangerous competitors.

H. K. Miller, V. S.

New York, N. Y.

According to the Veterinary Record of May 1st, the Council of the Royal College of Veterinary Surgeons has formally approved of regulations for academic costume to be worn by Fellows and Members of the college. The gowns will be black with maroon facings. The F. R. C. V. S. gown will have facings five inches wide, continued to the back of the gown at the neck, with the forearms of the sleeves looped up with a cord and button of maroon silk. The M. R. C. V. S. gown is of similar make, except that the facings will not extend to the back and the width

is limited to two inches. The hat for the Fellows and Members is to be the round doctor's hat of black velvet. The costumes are to be worn at municipal or academic functions and by new members, on graduation, when they receive their diplomas.

SUGGESTIONS FOR THE ADMINISTRATION OF TETANUS ANTITOXIN

As a prophylactic, tetanus antitoxin is perhaps as nearly a specific as any biological product which the veterinarian has at his command. It may be of interest to note that about fifteen years ago the United States Bureau of Animal Industry carried on a series of experiments with eight head of horses at their experimental farm at Bethesda, Maryland, to determine the smallest amount of tetanus antitoxin required for prophylaxis. The results of this work showed that 500 units was sufficient to prevent the development of tetanus in horses which had been inoculated with living cultures of tetanus bacilli, and that this dose was effective when administered as late as 96 hours after such inoculation. It should not be inferred, however, that a dose of this size is always sufficient or that it could be safely adopted as a standard. It is best to be on the safe side, and to give no less than 1500 units as a prophylactic dose, especially when the time of injury is unknown or when the injury is a severe one.

As a curative agent, tetanus antitoxin has given very satisfactory results in the hands of many veterinarians. No doubt many of the negative results reported are due to the fact that treatment was delayed too long. Tetanus toxin has a great affinity for nerve tissue, and when union has once taken place tetanus antitoxin cannot readily neutralize the combination.

Nevertheless, even after tetanus symptoms have appeared, tetanus antitoxin has the power of neutralizing any free toxin it may encounter in the tissues, and in this way, by preventing further damage, it may save the patient's life. The quantity of tetanus antitoxin for curative purposes should never be less than 20,000 units, and even as much as 40,000 units may be even better. It is far better to give a large initial dose as early as possible than to give a number of smaller doses at intervals, for the object is to neutralize the tetanus toxin before it has an opportunity of combining with the tissues.

Good results have been reported as a result of intraspinal or intraneural injections in human practice, and reports of European veterinarians make it appear that very satisfactory results have also been obtained from intra-arterial injections (carotid artery) in horses. This latter method deserves further trial, because when the antitoxin is administered in this way it is supposed to be carried directly to the cells by way of the capillaries and intercellular spaces, and in a more highly concentrated form than if given subcutaneously or intravenously.

It should not be forgotten that the antitoxic unit value as well as the neutralizing effect of tetanus antitoxin depends largely upon the method employed in manufacture and standardization, and if satisfactory results are to be expected the veterinarian should specify on his orders the product of a reliable manufacturing house. An announcement on tetanus antitoxin by Parke, Davis & Company, an old reliable firm, will be found in the advertising section of this magazine.

The Pennsylvania Department of Agriculture issued a quarantine order against cattle from Illinois, effective May 1st, stating that cattle of questionable health were being offered freely for sale in Illinois and had come into the hands of unsuspecting purchasers in Pennsylvania. The regulation provides that (1) apparently healthy cattle of strictly slaughter type may be consigned to approved slaughter houses for immediate slaughter within ten days of arrival; (2) cattle from accredited herds and accredited areas will

be admitted when accompanied by an official certificate showing such accreditation; (3) all other cattle, including stockers and feeders, must be accompanied by a certificate of health and tuberculin test made by an approved veterinarian and signed by the federal or state official in charge—such cattle will be held in quarantine at destination for sixty days at owner's expense and retested with tuberculin; except, when such cattle are billed to or through the stockyards at Pittsburgh or Lancaster, the certificate of health and tuberculin test will not be required but the cattle will be examined and tested at those yards, then forwarded to destination in quarantine to be retested in sixty days. The regulation applies to calves as well as mature cattle.

MILK FEVER IN SHEEP

So far as I am aware, the condition known as "milk fever" in cows has not been receiving the attention it should when it affects sheep. I have had described to me by farmers a form of paralysis in in-lamb or recently-parturient ewes, but it was not until this last month that I had an opportunity of observing any cases.

The first case had been delivered twenty-four hours, had suddenly lost the power of standing and was rapidly becoming unconscious. The symptoms exhibited so closely resembled those seen in cattle affected with "milk fever," that I administered the usual treatment with a satisfactory result. A few days later I was asked to see a ewe in the last week of pregnancy showing symptoms of "milk fever"—lack of appetite, unconsciousness, grinding of the teeth, etc. Although she had not been delivered, her udder was prepared and inflated. Later, when she was conscious, she was given stimulants and laxatives.

As the lambing season is now in full swing, I hope to have further opportunities of studying this interesting complaint.—W. E. Armstrong in The Veterinary Record.

HEAVY LAMBS THIS SEASON

An unusually large supply of lambs in many districts has reduced the price of this excellent meat, and housekeepers are taking advantage of the opportunity to serve frequently what is sometimes regarded as a luxury. The United States Department of Agriculture points out that although during this season some lambs are heavy the housewife need not be afraid she is getting meat from mature animals. Legs will often weigh from 6 to 8 pounds although from lambs not yet one year old. If this size is too large, the purchaser may have several pieces sliced from the top to be cooked as cutlets or chops. When the remainder of the leg is roasted the cut surfaces will be sealed to retain the juices by quick searing in the oven.

A shoulder roast of lamb is tender and delicious if properly cooked. To facilitate carving it should be boned and rolled, or at least have the shoulder blade removed. Many people like to stuff the cavity with a bread crumb or spinach stuffing.

Chops cut from the neck may be seared and cooked in the oven and will be found palatable and tender. In Turkish and Armenian restaurants lean meat from the neck and shoulder of lamb is cut in blocks about an inch and a half square and run on meat skewers. These skewers of meat which are known as "kebab," are seasoned and broiled or fried like chops. This suggests a good way of using pieces of irregular shape. Stews and broths take care of the parts of the lamb which are not adapted to quick cooking methods. In making either it is well to cook the meat tender some time before it is wanted, and allow it to cool so the fat can be skimmed off.

Manufactured on the special order of the University of Minnesota board of regents, a large animal operating table was recently delivered by William Sellers & Co. of Philadelphia to the division of veterinary medicine at University Farm, St.

Paul. The table is operated by an electric motor and hydraulic pump and is so generous in its proportions that the largest horses and cows can be strapped upon it. Dr. C. P. Fitch, chief of the veterinary division of the university, says that only a few tables of its kind are in use in this country. It will be used at Minnesota chiefly for operations on large animals and for short course work with veterinarians and student classes.

VACCINATION AGAINST FOWL CHOLERA

Having determined that the pasteurella of rabbit septicemia is non-pathogenic towards fowls, Staub has utilized a strain of this origin in order to vaccinate against fowl cholera.

A rabbit strain which had been passed several times through the peritoneal cavities of guinea-pigs was used as a vaccine in several outbreaks of the disease. It was found that not only were the in-contact fowls protected, but also that many which were visibly affected made a complete recovery.

The immunity, however, was not of great durability, for birds vaccinated with the rabbit strain sometimes succumbed to fowl cholera several months later. This disadvantage was overcome by the use of a second vaccine prepared from a strain of B. avisepticus attenuated by the usual pasteurian method.

The advantages claimed are the rapid production of an immunity in an affected flock and the possibility of saving some of the birds which are in the early stage of the disease by means of the first vaccine. This transient immunity can then be reinforced by the use of the second vaccine without fear of the complications which sometimes result from the classical method of vaccination.

(Quatre Annèes de Vaccination contre le Cholera des Poules. A. Staub. Ann. de l' Inst. Pasteur, 1925, December, Vol. 39, No. 12, p. 962.)—The Veterinary Record.

BOOK REVIEWS

Veterinary Toxicology, by G. D. Lander, D. Sc. Second edition. Cloth; 325 pages; 39 illustrations. Price $3.00. Alexander Eger, Publisher, Chicago.

The first edition of this work was published thirteen years ago, and the subject of veterinary toxicology has been marked by many important developments since that time, notably in the recording of new cases of known types of poisoning and by the recognition of formerly unsuspected toxic agents. It has been the aim of the author to include these additional data in the present volume.

As in the former edition, the book is divided into five sections, as follows: the introduction, which gives a general discussion of poisons and poisoning; mineral or inorganic poisons; organic poisons and drugs; poisonous plants; chemical toxicology.

The section on poisonous plants occupies more space than any of the others, 142 pages being devoted to this subject, although as the author states, only the common poisonous plants are dealt with. In the revision of this section, extensive use has been made of the review of poisonous plants by Craig and Kehoe in 1925.

A list of 272 authorities is given to which reference is made in the text.

The Internal Secretions of the Sex Glands, by Alexander Lipschutz, M. D. Cloth; 513 pages; 140 illustrations. Williams & Wilkins, Baltimore.

This is a most interesting work, a record of research carefully performed and convincingly described. The practical application in veterinary practice of the operations developed by the author, is exceedingly limited, if existent at all. Nevertheless, the experimental work of Professor Lipschutz was carried out to such a large extent on animals that the record contains a fascination for anyone interested in animal surgery and comparative physiology.

The work strikingly emphasizes the tremendous influence of internal secre-

tions of the sex glands on conformation, disposition and habit, and the certainty with which marked somatic changes can be produced by the transplantation even of minute portions of the gonads of the opposite sex.

The Bacteriophage and Its Behavior, by F. d'Herelle. Translated by Geo. H. Smith, School of Medicine, Yale University. Cloth; 600 pages; illustrated. Price $8.00. Williams & Wilkins, Baltimore.

The investigations of Dr. d'Herelle on this subject were first made public in 1921, when the results of his observations were published in French, the work being revised, enlarged and translated into English in 1922 under the title "The Bacteriophage; Its Role in Immunity." In 1923 he published a further book in French, which revised and doubled in volume, appeared in English under the title "Immunity in Natural Infectious Disease."

The present volume is also a translation from the French. It represents a new and extended treatment of the subject in view of the additional data acquired since the publication of the former volumes. It also embraces a review of all important work done in bacteriophagy —both of Dr. d'Herelle and of other workers.

The book is in three parts with an introduction, consisting of chapters on history and on terminology and technic. Part I deals with the phenomenon of bacteriophagy; Part II with the behavior and nature of the bacteriophage; Part III with the antigenic properties of the bacteriophage and its behavior in disease and in epidemics; and specific therapy. A bibliography of 647 references is appended.

The phenomenon of bacteriophagy is described as the dissolution of bacteria, accomplished through the action of a "principle" which passes through porcelain filters and even through ultrafilters with pores having a diameter of one one-millionth of a millimeter (about one 25-millionth of an inch).

It is stated that this dissolving principle has been found to be present in the intestinal contents of normal man and of healthy animals, and particularly in those who are convalescent from a bacterial infection, in the urine of these convalescents, in their blood, in pus, in river water and in cultivated soil.

The methods of isolating the bacteriophage are discussed, and in this connection, it is brought out that other filterable organisms or ultraviruses possess dimensions comparable, or possibly identical, with those of the bacteriophage, yet isolation may be accomplished by heating, where the associated ultravirus is less resistant than the bacteriophage, or by several successive passages in the presence of a susceptible bacterium, in which case only the bacteriophage will multiply and the associated virus is eliminated by dilution.

The phenomenon of dissolution occurs only with living bacteria and does not take place in the presence of antiseptics when the amount present is sufficient to modify the state of the bacteria. Dissolution of the bacteria is accompanied, not only by a regeneration of the active agent, but by a very pronounced multiplication of the principle.

The author discusses the several hypotheses which have been advanced to account for the "principle" involved in bacteriophagy, which phenomenon in itself has been observed and recognized by many investigators, and he comes to the conclusion that the bacteriophage is a living being, multiplying at the expense of the bacterium, that it is endowed with the powers of assimilation, adaptation, reproduction and variability. In other words, it is a living parasite of bacteria, to which he has given the technical name of Protobios bacteriophagus. It is explained that in the term "bacteriophage," the suffix "phage" is not used in the ordinary etymological sense of "eater" but in the sense of "developing at the expense of," a meaning for which it is claimed there is ample precedent in scientific literature.

It is pointed out that it is much easier to prove that the bacteriophage is normally present in the intestinal tract of animals than in man. In the latter the bacteriophage usually shows a virulence only for the strain of B. coli with which it is maintaining a symbiotic relationship, while in domestic animals it is rarely so limited, but the virulence extends to the dysentery strains and to the paratyphoid bacilli. Demonstrations of the bacteriophage are described in horses, cattle, buffaloes, swine, goats, dogs, cats and poultry. It is also mentioned that the process of bacteriophagy is not restricted to animal life, the principle likewise having been observed in plants. It is interesting to note that the author holds the view that "the ultraviruses form, most probably, a group of unimicellar beings from which, by evolutionary processes, all other living beings have developed."

Experimental studies of the possible use of the bacteriophage in the treatment of disease have been made on a considerable number of cases. For many diseases and infections—dysentery, typhoid, intestinal disturbances, infected wounds, staphylococcus and streptococcus infections, plague,—it is stated that the action of the agent has been found potent and rapid. In the case of infected wounds, bacteriophagic treatment is said to be in use at a number of hospitals.

The behavior of the bacteriophage in disease, the author says, varies according to conditions in the intestine, and hereditary characters of the race of bacteriophage and of the strain of bacteria involved.

All conditions favoring the bacteriophage, its acquisition of its virulence is immediate, the result being the elimination of the bacterium before it can develop.

Under less favorable conditions, bacteriophagy takes place after a latent period. The result is a few mild symptoms, then the clearing up of the disorder. The disease is aborted.

When the virulence of the bacteriophage is built up only after considerable delay, the result is a progress of the disease to a point, then a gradual repression, and convalescence of the patient.

When the virulence of the bacteriophage develops very slowly, or when the bacteria at the time of invasion have an acquired resistance a struggle ensues, the patient's condition reflecting the ups and downs. The outcome is in doubt.

When the bacteriophage remains wholly inert, the result is the unhindered development of the bacteria and the death of the patient.

Of interest to veterinarians, it may be mentioned that according to studies made up to the present time, the following bacterial species infective to animals are given as being susceptible to bacteriophagy: B. gallinarum and related organisms, Pasteurella bovis, B. suipestifer, B. enteritidis, staphylococcus, streptococcus.

Diseases of the Dog and Their Treatment, by George Muller and Alexander Glass. Translated by A. A. Leibold, Paul Fischer and Alexander Glass. Fifth edition, revised and enlarged. Cloth; 670 pages; 263 illustrations. Price $6.00. Alexander Eger, Publisher, Chicago.

This has long been a recognized work on the subject, and the present edition contains many important revisions and additions, over 250 pages of new matter not in previous editions having been added.

The book is divided into nineteen sections, dealing with general examination; diseases of the digestive apparatus, respiratory organs, circulatory apparatus, urinary apparatus, sexual organs, nervous system, thyroid gland, true infection, blood and metabolism, organs of locomotion; wounds and contusions; diseases of the claws and foot-pads; hernial rupture, diseases of the eyes, of the ear, of the skin; tumors; and intravenous injections and infusions.

Diagnosis is given a prominent place and the tested and approved treatment given relative to each condition or disease

discussed. Altogether some 300 different affections of the dog are considered in the volume, making it the most complete work so far available on canine practice.

Animal Heroes of the Great War, by Ernest Harold Baynes. Cloth; 307 pages; 67 illustrations. Price $3.50. The Macmillan Co., New York.

To secure the material for this book, the author traveled for nine months in Europe, Egypt and Palestine. He tells of the draught horses, toiling and struggling through the mud of Flanders, of the swift chargers of Allenby's cavalry in Palestine, the camels winding over the desert sands, the indispensable mules and the ponderous oxen, hauling supplies and equipment.

He writes, too, of the dogs—sentries at the outposts, guardians of property, carriers of dispatches through shot and shell—and those other couriers, the racing pigeons, homing through the hail of shrapnel, or flying over miles of sea to carry the message which would bring rescue to the men on the wrecked seaplane.

A chapter is devoted to a very excellent account of the American Army Veterinary Service, giving a brief history of the development of the service in this country from 1792 until the formation of the Veterinary Corps in 1917 and its work during the World War.

An equally interesting description is given of the part played by the British Army Veterinary Corps.

A concluding paragraph of the volume sums up man's dependence on animals as follows:

"When we plume ourselves upon the accomplishments of man, we shall do well to pause in our self-gratulation to reflect upon the magnitude of the services rendered by our Animal Allies. Can one imagine man deprived of his comrades and helpers, the dog and the horse, on the long weary march down blood-drenched centuries? And what could have supplied the place of his faithful burden-bearers, the ass, the mule, and the camel? Could man have attained to his high position had he lacked the support of these strong, loyal, and courageous friends and servants? Answer these questions as you will, you will have to concede that the side without animal allies in the Great War would have been the side doomed to go down in defeat."

Guaranized eggs is a trade name for eggs that have been treated by a special patented process. The important factor of the processing is the immersion of eggs in a hot solution, the principal ingredient of which is an odorless and tasteless mineral oil. The object of this treatment is to close the pores in the egg shell and thus prevent evaporation.

The men killed in battle during the four years of the Civil War were less in number than the people who died of tuberculosis in this country in the four years between 1906 and 1910. Even in the World War it was a great battle where more than 15,000 men were killed; and yet more than that number are killed by automobiles in the United States every year—many more than all the deaths from battle and disease during the Spanish-American War.

And then, look over the statistics of deaths from typhoid, malaria, syphilis, tuberculosis, diphtheria and all the long list of diseases due to well-known and controllable causes. All these deaths were preventable—unnecessary—and their total for a year and a half would not be far, if at all, behind the deaths on the battle fields of France; certainly not if we add to the list the fatalities which annually result from various types of heart disease, nephritis and diabetes and which are equally preventable, not by organized community and state hygiene and sanitation but by the reorganization of personal ways of living—by intelligent and continuous individual self-government.—Clinical Medicine.